LG TRAINING MANUAL

Fall 2008 PDP Training

42PG20

Phone Contacts:

Contact	Number	Hours of Operation
Customer Service	(800) 243-0000	24 hours a day / 7 days a week
Technical Support	(800) 847-7597	7am-7pm Mon-Fri / Sat 8-2 CT
Parts Sales	(888) 393-6484	7am-7pm Mon-Sat CT
Training Center	(256) 774-4051	8am-5pm Mon-Fri CT

Web Contacts:

Web Site	Address	Description
LG USA	www.lgusa.com	Product information
Customer Service	us.lgservice.com	User manuals, FAQs
GCSC	aic.lgservice.com	Service manuals, parts, bulletins
Customer Service Academy	www.lgcsacademy.com	Web training, discussion forum
Live Training	lge.webex.com	Live training

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IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-visual service technicians. When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Electronics. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring, and lead dress must conform to original layout upon completion of repairs. If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it only with the factory specified fuse type and rating. When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB. Always keep wires away from high voltage or high temperature parts. Do not attempt to modify this product in any way.

Special components are also used to prevent shock and fire hazard and are required to maintain safe performance. No deviations are allowed without prior approval by LG Electronics. Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines. Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

ELECTROSTATICALLY SENSITIVE DEVICES

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on the body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as an ESD mat, to prevent electrostatic charge buildup or exposure of the assembly. Use only a grounded-tip soldering iron to solder or unsolder ES devices. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices. Do not use refrigerant-propelled chemicals which can generate electrical charge sufficient to damage ES devices. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.

REGULATORY INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; Increase the separation between the equipment and receiver; Connect the equipment into an outlet on a circuit different from that to which the receiver is connected; Consult the dealer or an experienced radio/TV technician for help.

The responsible party for this device's compliance is: LG Electronics of Alabama, Inc. 201 James Record Road. Huntsville, AL 35813, USA. Digital TV Hotline: 1-800-243-0000

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OVERVIEW 2008 PDP

INTRODUCTION

This manual covers two models from the 2008 Plasma Display Panel (PDP) product line. Each model is an HDTV with integrated HD tuner. All 2008 PDP models include USB Media Host and SimpLink. USB Media Host consists of a USB port on the back of the TV that supports USB flash memory drives loaded with media or firmware for the TV. SimpLink allows for control of other LG SimpLink products via the HDMI connection.

All PDP TV models are covered by a one year parts and labor warranty. Refer to the last page of the owner's manual for more warranty information. When making a warranty repair involving a service bulletin, be sure to refer to the service bulletin number in the warratny claim.

BASIC TROUBLESHOOTING STEPS

Define - Look at the symptom carefully and determine what circuits could be causing the failure. Use your senses Sight, Smell, Touch and Hearing. Look for burned parts and check for possible overheated components. Capacitors will sometimes leak dielectric material and give off a distinct odor. The frequency of power supplies will change with the load, or listen for a relay closing, etc. Observation of the front Power LED may give some clues.

Localize - Carefully check the symptom and determining the circuits to be checked. After giving a thorough examination using your senses, check the DC Supply Voltages to those circuits under test. Always confirm the supplies are not only the proper level, but are noise free. If the supplies are missing check the resistance for possible short circuits.

Isolate - To further isolate the failure, check for the proper waveforms with an Oscilloscope to make a final determination of the failure. Look for correct Amplitude Phasing and Timing of the signals. Also check for the proper Duty Cycle of the signals. Sometimes "glitches" or "road bumps" will be an indication of an imminent failure.

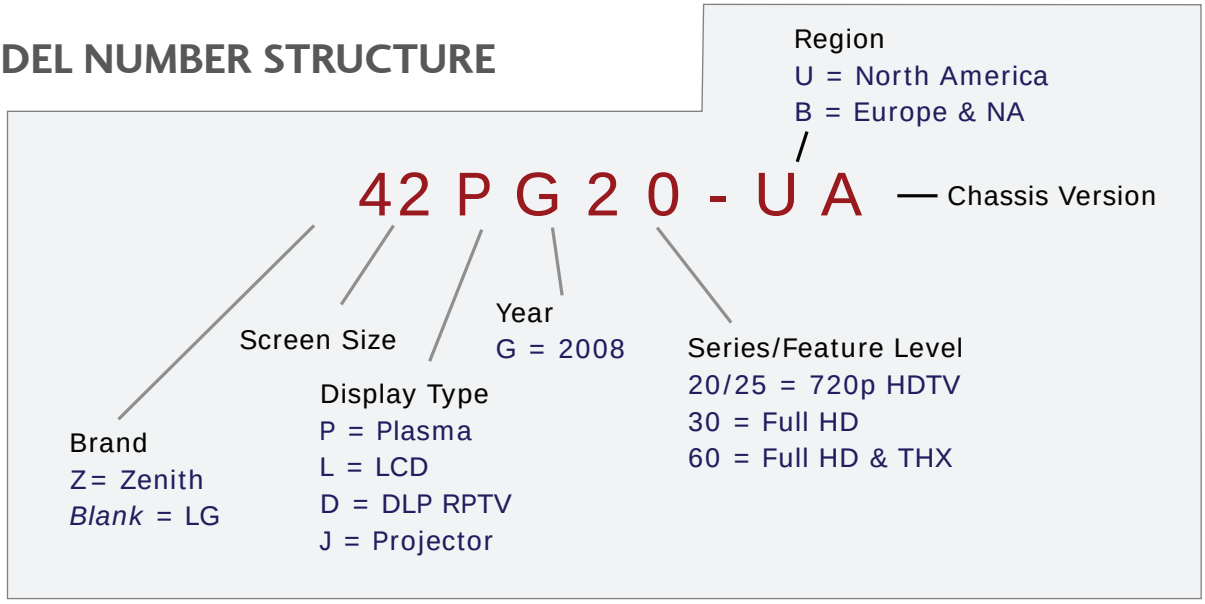
Correct - The final step is to correct the problem. Be careful of static sensitive components and make sure to check the DC Supplies for proper levels. Make all necessary adjustments. Lastly, always perform a Safety AC Leakage Test before returning the product back to the Customer.

CAUTION

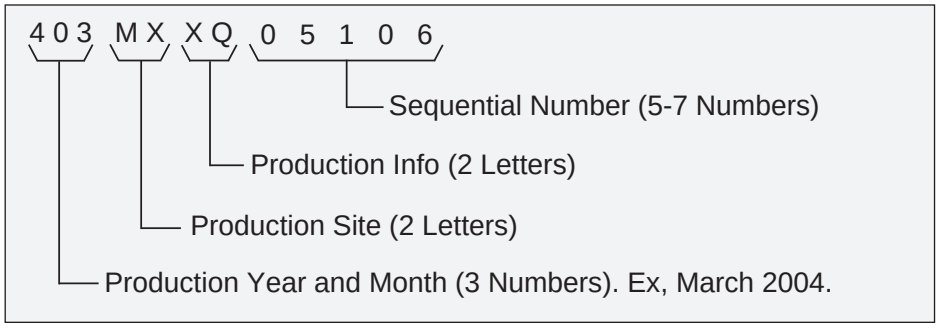
1) A (approximately) 10 minute pre-run time is required before any adjustments are performed.

2) Refer to the Voltage Sticker inside the panel when making adjustments on the Power Supply, Y-Sus and Z-Sus boards and adjust to the specified voltage level (±1/2 V).
3) The PDP module uses high voltage, be cautious of electric shock from the PDP module. Before circuit board removal, check that the Power Supply and drive circuits are completely discharged because of residual current stored.
4) C-MOS circuits are used extensively for processing the Drive Signals and should be protected from static electricity.
5) The Plasma television and/or PDP Module *must* be carried/transported vertical, not horizontal. (If laying down on its face, foam padding is a must).
6) Exercise care when making voltage and waveform checks to prevent costly short circuits from damaging the unit.
7) Be cautious of loose screws and other metal objects to prevent a possible short in the circuitry.
8) New panels and frames are much thinner than previous models. Be Careful with flexing these panels. Be careful with lifting panels from a horizontal position. Damage to the Frame mounts or panel can occur.

MODEL NUMBER STRUCTURE



SERIAL NUMBER STRUCTURE



REMOTE CONTROL

2008 models feature a newly designed, easier to use remote. The remote has fewer buttons than previous designs which was accomplished by moving many functions to an on-screen Quick Menu. The “Q. MENU” button on the remote opens the Quick Menu and the user can choose between options like aspect ratio, closed captions, sleep timer, etc.

The remotes are programmable for other devices. They also support SimpLink devices. When using SimpLink, the device buttons on the remote do not need to be pressed to switch modes before controlling external equipment. So, the External devices are controlled by the TV instead of the remote.

NEW FEATURES

Below are some of the new features on some 2008 PDP TVs.

FluidMotion (180Hz Effect) - Enjoy smoother, clearer motion with all types of programming such as sports and action movies. The moving picture resolution give the impression of performance of up to 3x the panels actual refresh rate.

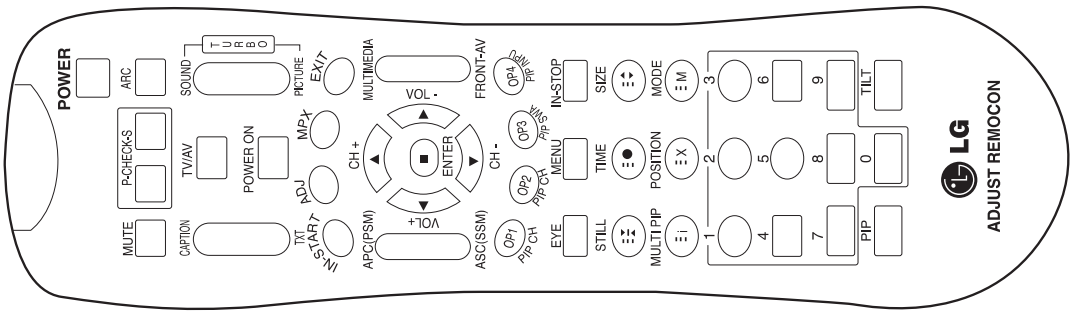
Full HD 1080p Resolution - Displays HDTV programs in full 1920 x 1080p resolution for a more detailed picture. Standard HD PDPs are 1365 x 768p.

Expert Menu - Expert Menu features Imaging Science Foundation Certified Calibration Controls (ISFccc) which allow precise in-home picture calibrations.

Public Display Mode - This is an additional menu with advanced startup options like startup volume, start channel, etc. This can be accessed by holding the Menu key until it vanishes. Then key in 1, 1, 0, 5, and press enter.

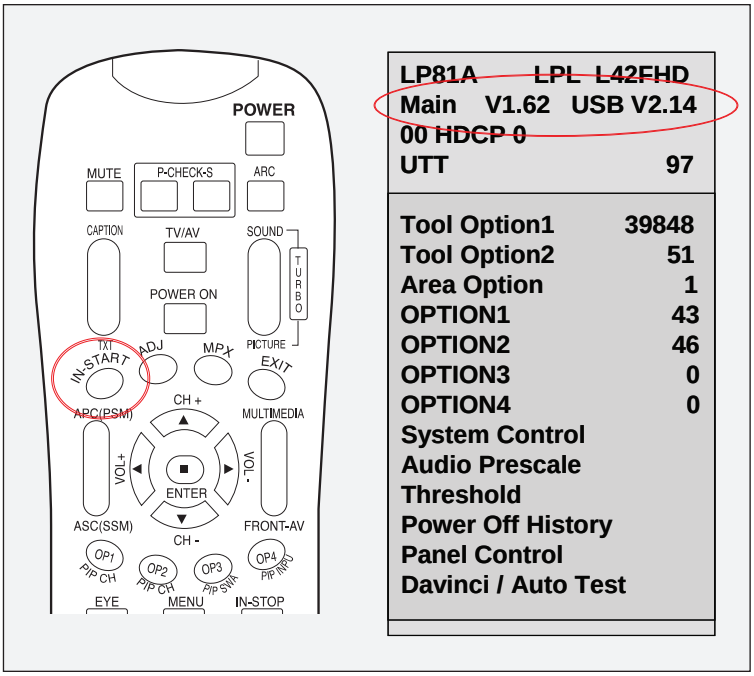
SERVICE REMOTE

NUM	KEY	FUNCTION
1	POWER	To turn the TV on or off
2	POWER ON	To turn the TV on automatically if the power is supplied to the TV. Use the POWER key to deactivate; It should be deactivated when delivered.
3	MUTE	To activate the mute function.
4	P-CHECK	To check TV screen image easily.
5	S-CHECK	To check TV screen sound easily
6	ARC	To select size of the main screen (Normal, Spectacle, Wide or Zoom)
7	CAPTION	Switch to closed caption broadcasting
8	TXT	To toggle on/off the teletext mode
9	TV/AV	To select an external input for the TV screen
10	TURBO SOUND	To start turbo sound
11	TURBO PICTURE	To start turbo picture
12	IN-START	To enter adjustment mode when manufacturing the TV sets.
		To adjust the screen voltage (automatic): In-start mute Adjust AV (Enter into W/B adjustment mode).
		W/B adjustment (automatic): After adjusting the screen W/B adjustment Exit two times
13	ADJ	To enter into the adjustment mode. To adjust horizontal line and sub-brightness.
14	MPX	To select the multiple sound mode (Mono, Stereo or Foreign language).
15	EXIT	To release the adjustment mode.
16	APC(PSM)	To easily adjust the screen according to surrounding brightness.
17	ASC(SSM)	To easily adjust sound according to the program type.
18	MULTIMIDIA	To check component input.
19	FRONT-AV	To check the front AV.
20	CH	To move channel up/down or to select a function displayed on the screen.
21	VOL	To adjust the volume or accurately control a specific function.
22	ENTER	To set a specific function or complete setting.
23	PIP CH-(OP1)	To move the channel down in the PIP screen. To use as a red key in the teletext mode.
24	PIP CH+(OP2)	To move the channel in the PIP screen. To use as a green key in the teletext mode.
25	PIP SWAP(OP3)	To switch between the main and sub screens. To use as a yellow key in the teletext mode.
26	PIP INPUT(OP4)	To select the input status in the PIP screen. To use as a blue key in the teletext mode.
27	EYE	To set a function that will automatically adjust screen status to match. The surrounding brightness so natural color can be displayed.
28	MENU	To select the functions such as video, voice, function or channel.
29	IN-STOP	To set the delivery condition status after manufacturing the TV set.
30	STILL	To halt the main screen in the normal mode, or the sub screen at the PIP screen. Used as a hold key in the teletext mode. Page updating is stopped.
31	TIME	Displays the teletext time in the normal mode. Enables to select the sub code in the teletext mode.
32	SIZE	Used as the size key in the PIP screen in the normal mode. Used as the size key in the teletext mode.
33	MULTI PIP	Used as the index key in the teletext mode. Top index will be displayed if it is the top text.
34	POSITION	To select the position of the PIP screen in the normal mode. Used as the update key in the teletext mode (Text will be displayed if the current page is updated.)
35	MODE	Used as Mode in the teletext mode.
36	PIP	To select the simultaneous screen.
37	TILT	To adjust screen tilt.
38	0~9	To manually select the channel.



CHECK FIRMWARE VERSION

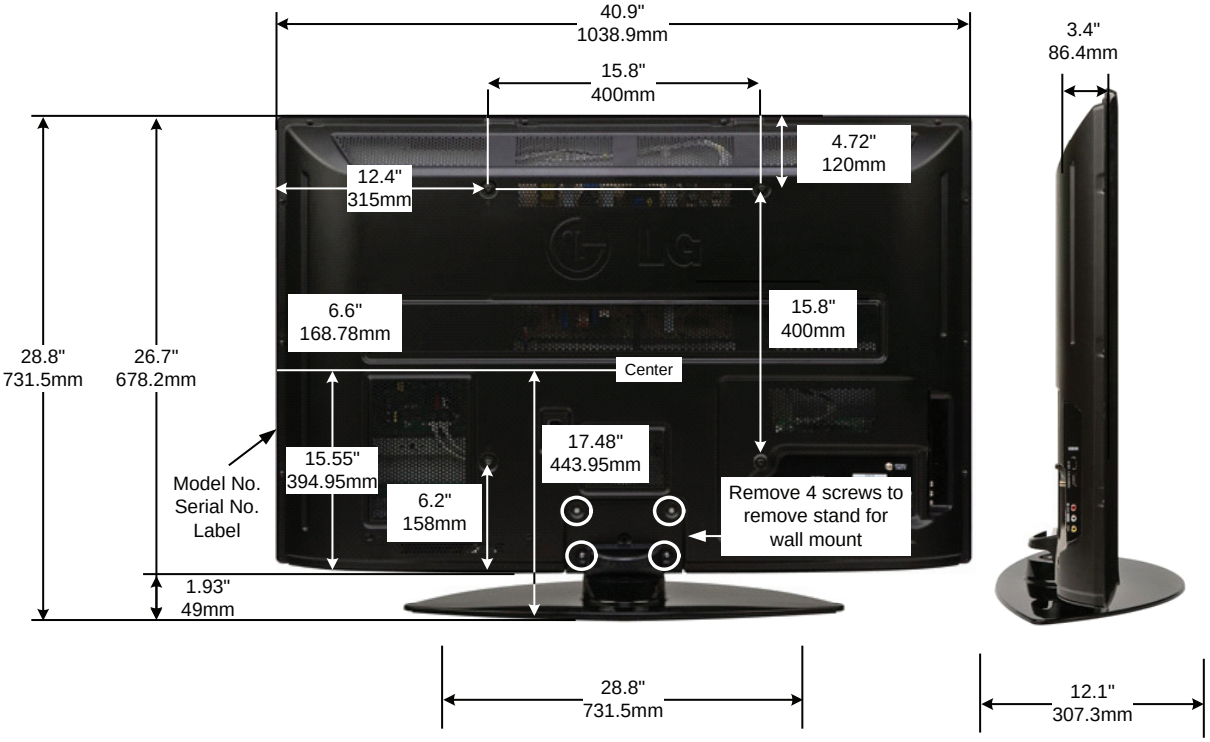
You can check the firmware version by opening the service menu. It is located near the top of the menu.



UPDATE FIRMWARE

1) Copy the firmware to the top level on a USB flash drive and to a folder named LG_DTV. Some models require the LG_DTV folder, and some don't. Put it in both locations if you are not sure which is correct. Only copy the file (or files) for the model you are currently updating.
2) Turn on the TV and insert the USB drive to the USB IN port.
3) If the firmware is newer than what is already installed, the upgrade menu should open automatically. If the update menu doesn't open, press MENU on the remote and select OPTION. Now press the 7 key 7 times and the upgrade menu will open.
4) Select START and press ENTER on the remote to start the software upgrade.
5) The TV will copy the update from the drive and then install it. Do not turn the TV off until it is finished.
6) The TV will automatically turn off and back on after the upgrade is successfully finished.
7) Check the firmware version to verify the update was succesful.

42PG20 DIMENSIONS



OVERVIEW

COMPUTER CONNECTION

A computer can be connected to the RGB (VGA) or HDMI connection on the TV. The HDMI connection will require a DVI to HDMI adapter if the PC has a DVI connector.

Set the monitor output resolution and vertical frequency on the PC before connecting it to the TV. Refer to the owner's manual for a full list of suported resolutions, some examples are listed below. The message "OUT OF RANGE" will appear on the screen if the resoultion is not supported.

Resolution	Vertical
30/40/50/60/70 series	
1280x768	60Hz
1360x768	60Hz
1366x768	60Hz
50/60/70 series only	
1600x1200	60Hz
1920x1080	60Hz

SERVICE MENU

The service menus can be used to make adjustments, change color alignment, and get software versions. There are two service menus. The Adjust and Instart menu can be accessed using the service remote (Service remotes are available from LG parts). They can also be accesed by holding down the menu button on the TV and the remote until the user menu disappears. The menus alternate between Adjust and Instart every time the menu button is held down. If the TV asks for a password, enter 0000 (four zeros).

POWER CONSUMPTION

Model				
	TYP	MAX UNIT	TYP	MAX UNIT
19LS4D-UA		42W	0.85	1W
20LS7D-NB		56W	0.85	1W
20LS7D-UK		56W	0.85	1W
22LC2D-UB		46W	0.85	1W
22LS4D-UA		46W	0.85	1W
23LS7D-NB		78W	0.85	1W
23LS7D-UK		78W	0.85	1W
26LC7DC-UB	110	160W	0.7	1W
26LC7DC-UK	30	160W	0.7	1W
26LC7D-UK	30	160W	0.7	1W
26LG30DC-UA	99	115W	0.36	0.8W
32LC4D-UA	150	190W	0.7	1W
32LC50C-UA		190W		3W
32LC5DC-UA		190W		3W
32LC7DC-UK	170	190W	0.7	1W
32LC7D-UB	150	190W	0.7	1W
32LC7D-UK	170	190W	0.7	1W
32LG30DC-UA	149	171W	0.36	0.8W
32LX50C-UA		190W		3W
32LX5DC-UA		190W		3W
37LC50C-UA		210W		3W
37LC5DC-UA		210W		3W
37LC7DC-UK	190	220W	0.8	1W
37LC7D-UB	180	220W	0.8	1W
37LC7D-UK	190	220W	0.8	1W
37LG30DC-UA	167	191W	0.36	0.8W
42LB50C-UA		240W		3W
42LB5DC-UA		240W		3W
42LC4D-UA	230	240W	0.8	1W
42LC50C-UA		240W		3W
42LC5DC-UA		240W		3W
42LC7DC-UK	220	240W	0.8	1W
42LC7D-UB	230	240W	0.8	1W
42LC7D-UK	220	240W	0.8	1W
42LG30DC-UA	226	244W	0.36	0.8W

DISASSEMBLY 42PG20

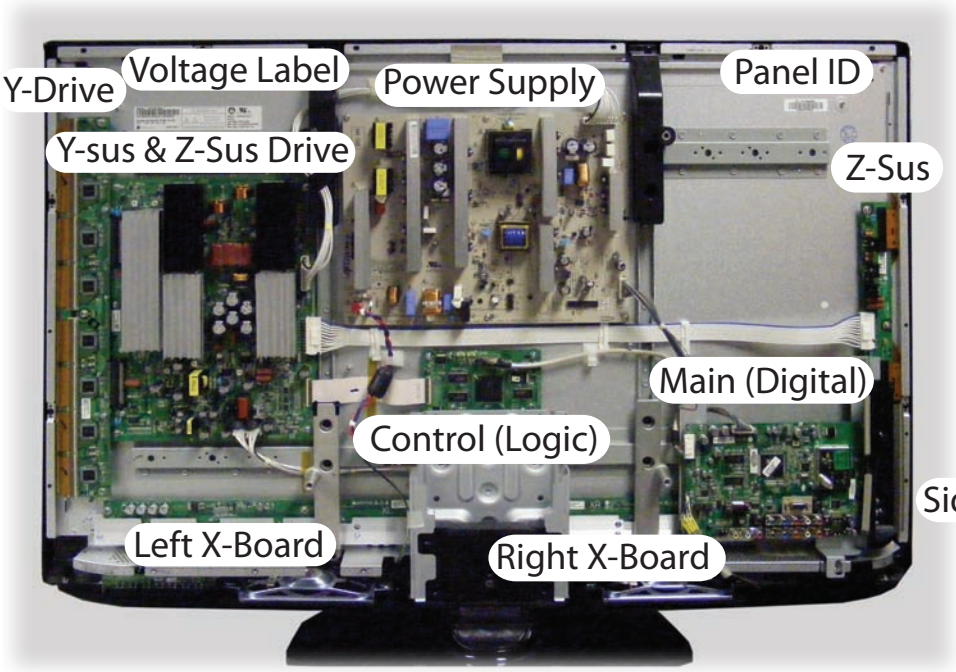
INTRODUCTION

This section of the manual will discuss disassembly of the 42PG20 PDP Direct View Television. Upon completion of this section the Technician will have a better understanding of the disassembly procedures, the layout of the printed circuit boards, and be able to identify each board. The plugs listed are from left to right Pin 1,2, 3, etc. Remember to be cautious of ESD as many semiconductors are CMOS and prone to static failure.

BACK COVER REMOVAL

Remove the 22 screws shown. Pay attention to the size and type of screw as there are different types. Putting in the improper screw when reassembling may cause damage. The stand does not need to be removed when removing the back.

BOARD LAYOUT



SWITCH MODE POWER SUPPLY REMOVAL

Disconnect the following connectors: P812, P813, CN101. Remove the 8 screws holding the board in place. Remove the board. When replacing, be sure to readjust the Va/Vs voltages in accordance with the Panel Label. Confirm VSC, -Vy and Zbias as well.

Y-SUS BOARD REMOVAL

Disconnect the following connectors: P201, P801, P101, P202. Remove the 8 screws holding the board in place. Remove the board. When replacing, be sure to readjust the Va/Vs voltages in accordance with the Panel Label. Confirm VSC, -Vy and Zbias as well.

Y-DRIVE BOARD REMOVAL

Disconnect the following Flexible Ribbon Connectors: P1, P2, P3, P4, P5, P6, P7 and P8. Disconnect the following connectors: P201, P801, P101, P202. Remove the 3 screws holding the board in place. Remove the board by lifting slightly and sliding the board to the left unseating P204 and P200. from the Y-Sus board.

Z-SUS BOARD REMOVAL

Remove the support frame holding the Main board. Disconnect the following connectors: P1, P2 and P3. Remove the 3 screws holding the board in place. Remove the board. When replacing, be sure to readjust the Va/Vs voltages in accordance with the Panel Label. Confirm VSC, -Vy and Zbias as well.

MAIN BOARD REMOVAL

Disconnect the following connectors: P701, P302, P303 and JK501. Remove the 2 screws holding on the decorative plastic piece on the right side. Remove the 4 screws holding the board in place. Remove the board.

CONTROL BUTTON BOARD REMOVAL

Disconnect the following connectors: P121, P160, P161 and P162. Remove the 2 screws holding the board in place. Remove the board. (Note: Power board is behind the Control board. Remove it's 2 screws and remove.

X-DRIVE BOARDS REMOVAL

X-Board Removal will require the most disassembly of all the boards. All the Brackets and Assemblies marked A-F (Image on next page) will need to be removed including the Stand. Before an X-Board can be removed. The Heat Sink assembly will also need to be removed.

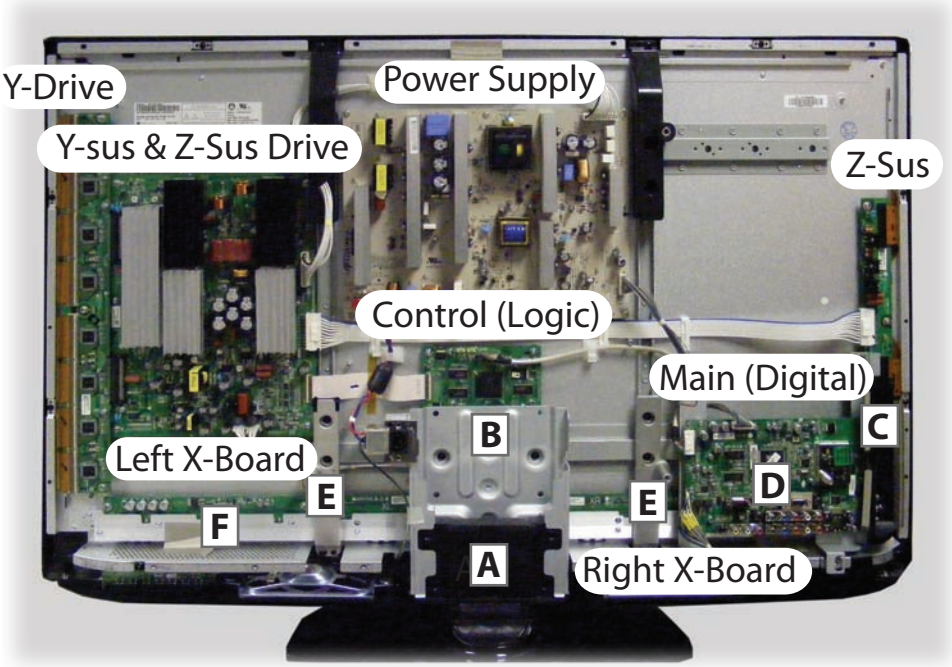
Lay the Plasma down carefully on a padded surface. Make sure AC is removed and remove the back cover and the stand. Carefully remove the LVDS Cable P121 from the Control board by pressing the Locking Tabs together and pull the connector straight back to remove the cable. (This prevents damage).

DISASSEMBLY

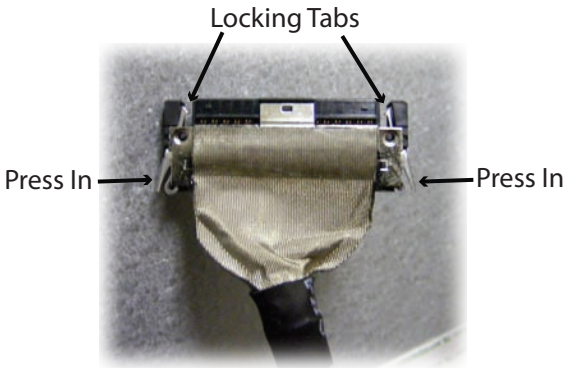
A) Remove the sStand mounting support plastic piece.

B) Remove the stand metal support bracket, unplug AC ground lug.

C) Remove the 2 screws from the decorative black plastic piece around side input jacks (Marked B) and remove.



D) Remove the 2 screws at the top of the Main board Mounting Bracket and peel the tape from the bottom. Remove connectors P303 and JK501. Carefully reposition the main board and mounting bracket up and off to the right side.

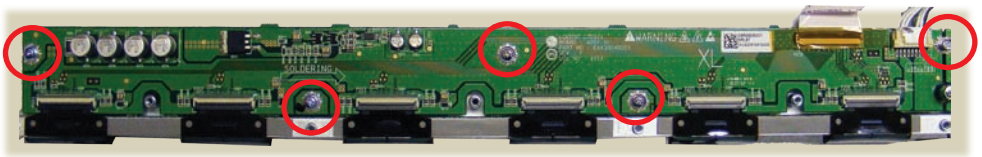


E) Remove the metal support brackets marked “E”.

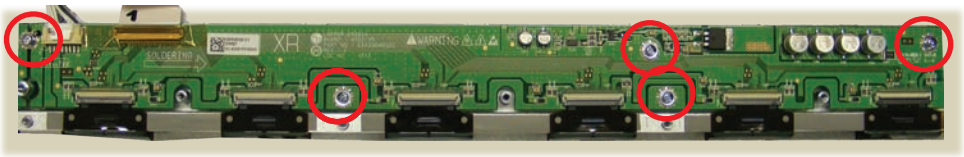
F) Remove the 13 screws holding the heat sink and carefully lift it straight up and off (remember that the TCP IC’s are located under the heat sink).

Disconnect all TCP ribbon cables from the defective X-Drive board and remove the 5 screws holding the board in place. Reassemble in the reverse order. Recheck Va/Vs/V-Scan/-VY/Z-Drive.

Left X-Board

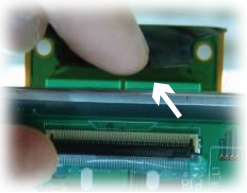


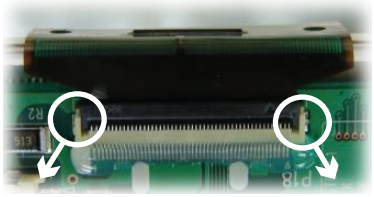
Right X-Board



TCP CONNECTOR REMOVAL

Lift up the lock as shown by arrows. (The Lock can be easily broken. It needs to be handled carefully.) Pull TCP apart as shown by the arrows. The TCP Film can be easily damaged, handle with care.

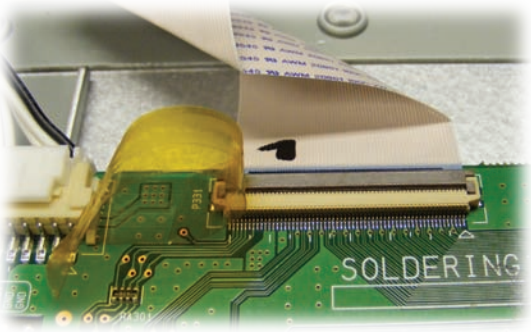




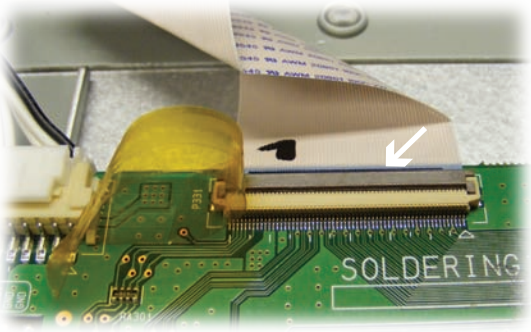
P232 & P331 CONNECTOR REMOVAL

The X-Drive boards can be removed after removing the back cover, the main board, and the heat sink covering the TCPs is removed (15 screws).

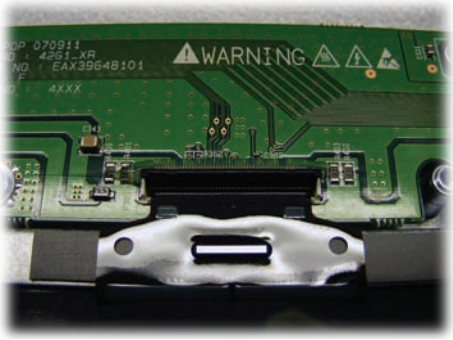
Peel the tape off the connectors and gently pry the locking mechanism upward.



Gently pry the locking mechanism upward on all TCP connectors P201-206 or P301-306.



Carefully lift the TCP ribbon up and off the cushion and out of the way.

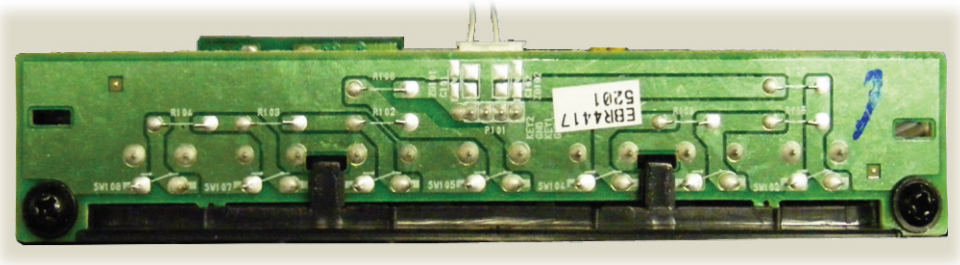


DISASSEMBLY

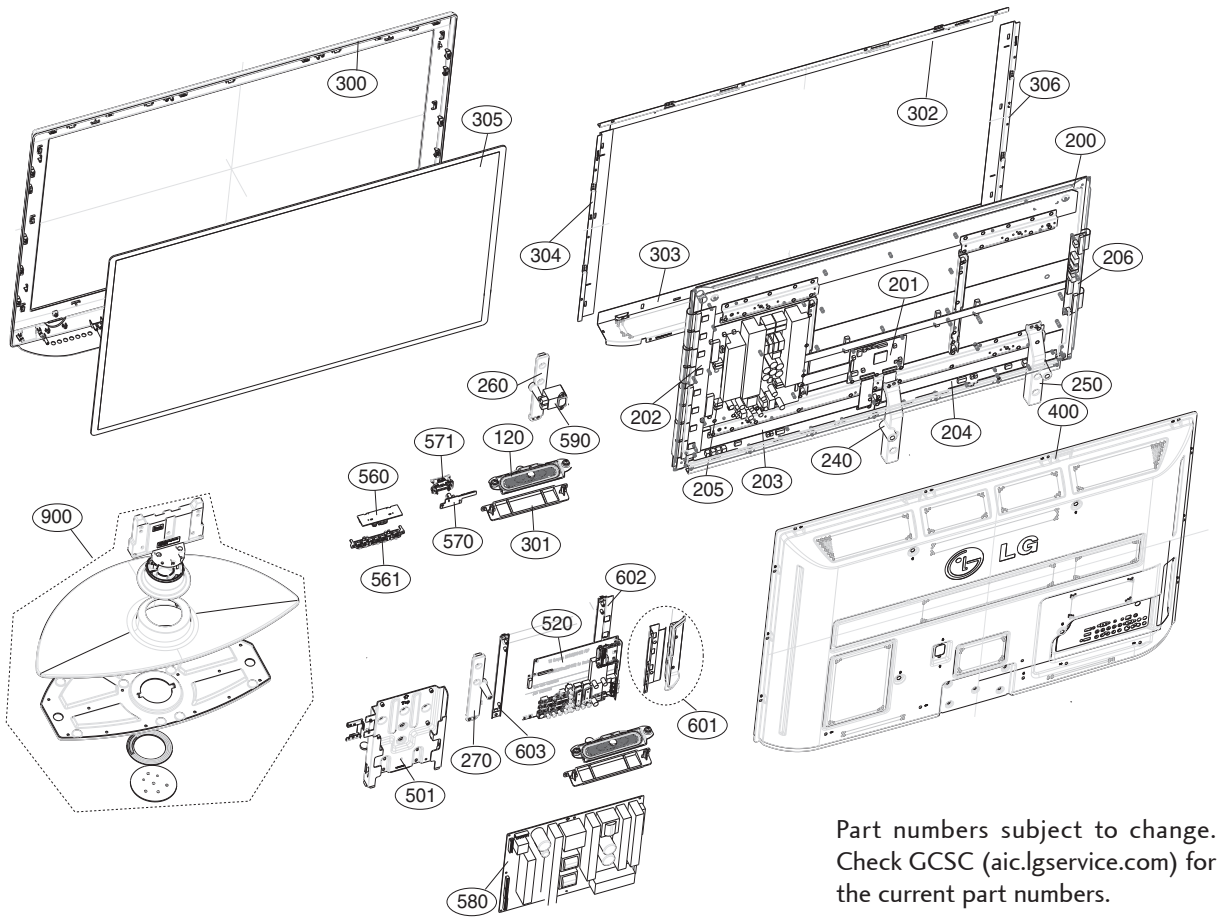
CONTROL BUTTON BOARD REMOVAL

The control button board and power switch board are located in the lower left hand section (as viewed from the rear).

To remove, unplug the connector P101 and remove the 2 screws. Under each screw there is a black tab. Release these tabs to lift the board upward. Then remove the connector from the power switch board and remove it's two screws.



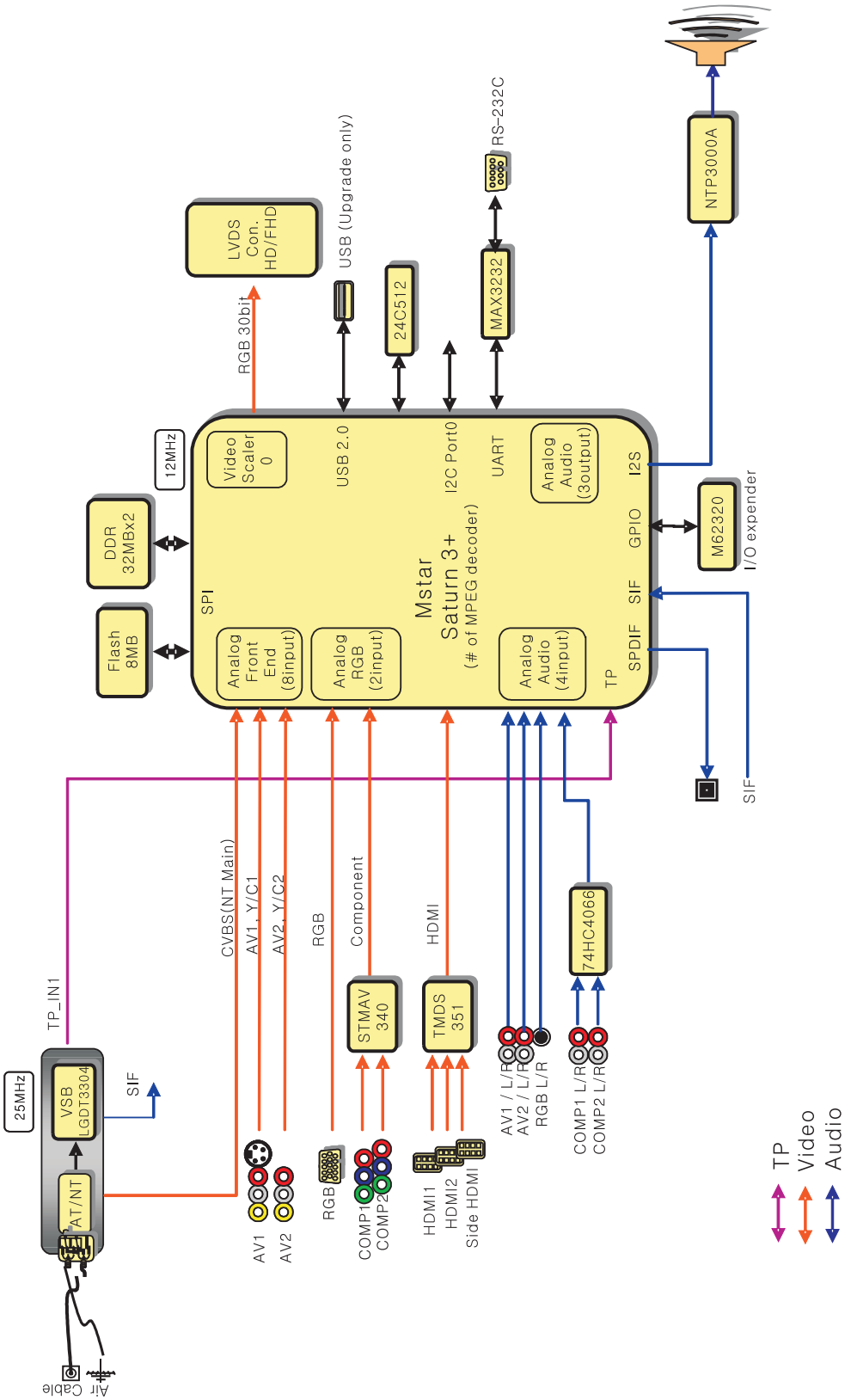
42PG20 EXPLODED VIEW



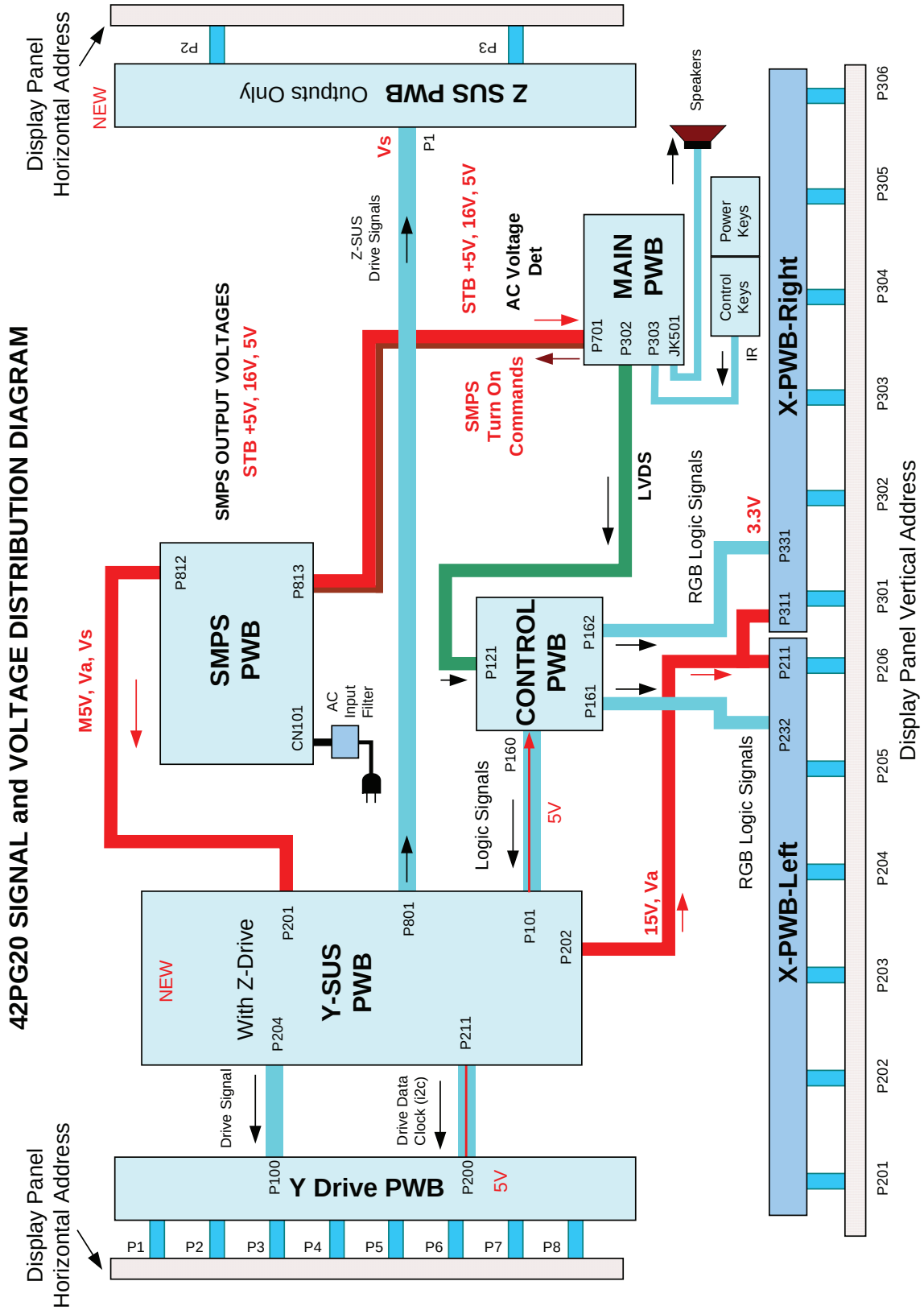
Part numbers subject to change. Check GCSC (aic.lgservice.com) for the current part numbers.

Location	Part Num	Description	Location	Part Num	Description
120	EAB42609901	Full Range Speaker	304	AJJ35122602	Right Filter Support
200	EAJ41970710	PDP Panel (PDP Module)	305	MDJ42350902	Glass Filter
201	EBR39594901	Control board (CTRL)	306	AJJ35122702	Left Supporter Assembly
202	EBR39712601	Y-drive (YDRV)	400	ACQ35123228	Rear Cover Assembly
203	EBR39595001	Left X-Drive (XRLB)	501	MGJ41164512	Main Supporter Plate
204	EBR39595101	Right X-Drive (XRRB)	520	EBR43929102	Hand Insert PCB Assembly,Main
205	EBR39706801	Y-Sustain (YSUS)	560	EBR43385504	Main/Digital PCB
206	EBR41668901	Z-Sustain (ZSUS)	560	EBR48957101	Sub PCB
240	AJJ35680107	Top Right Support	561	MBG41119902	Control Buttons
250	AJJ35680108	Top Left Support	570	EBR44168002	Sub PCB
260	AJJ35680203	Bottom Right Support	571	ABA36967703	Bracket Assembly
270	AJJ35680204	Bottom Left Support	580	EAY43533901	Power Supply (SMPS)
300	ABJ35121812	Front Cabinet	601	ABA35619217	Side Input Bracket Assembly
301	ABA36825001	Speaker Bracket Assembly	602	MGJ41163807	Main board Supporter
302	AJJ35122402	Top Filter Support	603	MGJ40268206	Side AV Shield
303	AJJ35122502	Bottom Filter Support	900	AAN35132205	Stand (Base Assembly)

BLOCK DIAGRAM



SIGNAL AND VOLTAGE BLOCK DIAGRAM



CIRCUIT DESCRIPTIONS 42PG20

INTRODUCTION

It is critical that the DC Voltage adjustments be checked whenever troubleshooting a problem. Especially when:

1) The SMPS (Switch Mode Power Supply), Y-Sus (Y-Sustain) or Z-Sus (Z-Sustain) are replaced.
2) The panel is replaced, since the SMPS does not come with new panel.
3) A picture issue is encountered.

PANEL LABEL

(1) Model Name
(2) Bar Code
(3) Manufacture No.
(4) Adjusting Voltage DC, Va, Vs
(5) Adjusting Voltage (Set Up/-Vy/Vsc/Ve/Vzb)
(6) Trade name of LG Electronics
(7) Manufactured date (Year/Month)
(8) Warning
(9) TUV Approval Mark
(10) UL Approval Mark
(11) UL Approval No.
(12) Model Name
(13) Max. Watt (Full White)
(14) Max. Volts
(15) Max. Amps

ADJUSTMENT ORDER **IMPORTANT**

DC VOLTAGE ADJUSTMENTS

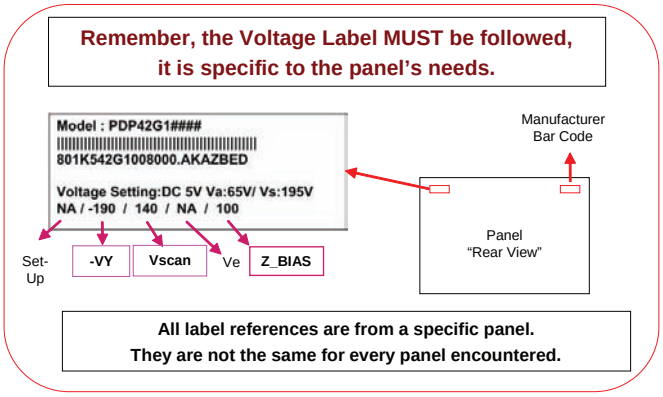
- SMPS board: Va Vs (Do SMPS adjustments first)
- Y-Sus board: Adjust Vscan, -Vy
- Y-Sus board: Adjust Zbias

WAVEFORM ADJUSTMENTS

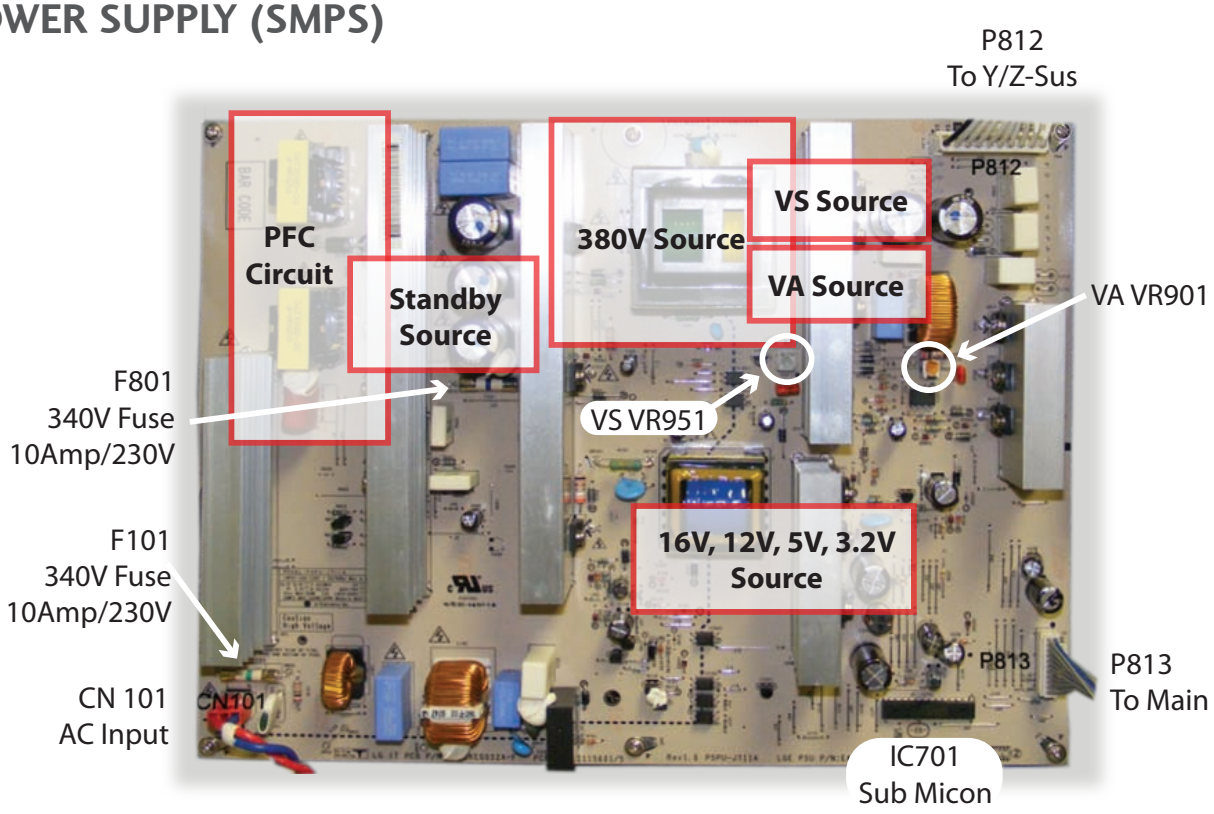
Y-Sus board: Ramp Up, Ramp Down.

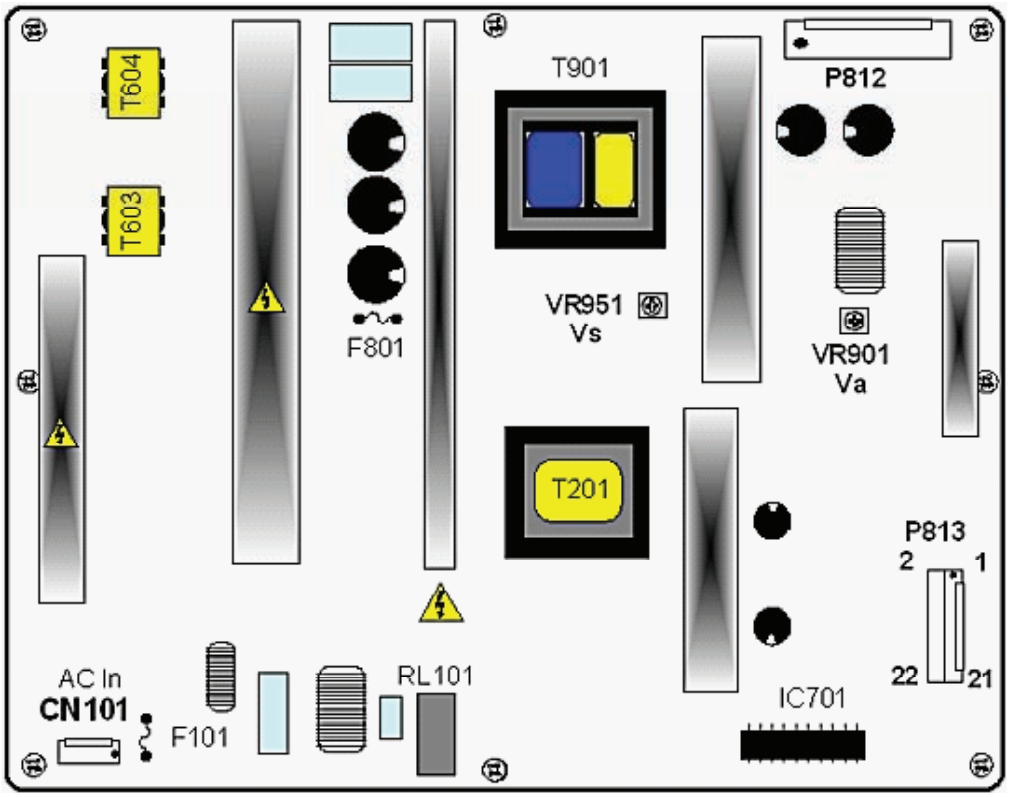
Only necessary when:

1) The Y-Sus board is replaced.
2) “Mal-Discharge” problems.
3) Abnormal picture issues.



POWER SUPPLY (SMPS)





= Shock Hazard

SMPS Outputs

Board	Voltage	Description
Y-Sus	VS	Drives the display panel Horizontal Grid
	VA	Responsible for display panel Vertical Grid
	M5V VCC	Used to develop Bias Voltages on the Y-Sus, X-Drive, and Control boards
Main	16V	Audio B+ Supply
	5V	Control Circuits

Adjustments

Voltage	Location
VA	RV901
VS	RV951
M5V VCC	Fixed

POWER SUPPLY OPERATION

Refer to the figures on page 25-27. AC Voltage is supplied to the SMPS board at Connector CN101 from the AC Input Filter. Standby 5V is developed from 340V source supply (which during standby measures 159V hot ground). This supply is also used to generate all other voltages on the SMPS.

The 5V (standby) voltage is routed to the Sub Micon circuit (IC701) on the SMPS and through P813 to the Main board or Micon (IC100). LD703 will glow green to indicate STBY 5V has arrived.

AC detect Pin 18 of P813 is generated on the SMPS by monitoring the AC input and rectifying a small sample voltage. This AC Detect Voltage is routed to IC701 on the Sub Micon on the SMPS and the Micon (IC100) located on the Main board. It is used as a basic “SMPS OK” signal.

When the Micon (IC100) on the Main board receives an “ON“ command from either the keyboard or the Remote IR Signal, it outputs a high to RL-ON. This signal first turns on a DC level shifter Q706 which creates 5V General. LD703 now glows amber indicating 5V General has been generated. This 5V General now provides the pull up voltages that supply the output circuits to the SMPS. The RL-ON enters the SMPS board at Pin 19 of P813. The RL-ON Voltage is sensed by the Sub Micon (IC701) circuit which causes the Relay Drive Circuit to close Relay RL101. this brings the PFC source up to full power by increasing the 159V standby to 340V. At this time the 16V source becomes active and sent to the Main board via P813.

The next step is for the Micon (IC105) on the Main board to output a high on M5V_ON Line to the SMPS at P813 Pin 21 which is sensed by the Sub Micon IC (IC701) on the SMPS turning on the 5V VCC line. The last step to bring the supply to “Full Power” occurs when the Micon (IC100) on the Main board brings the VS-ON line high at Pin 20 of P813 on the SMPS board which when sensed by the Sub Micon IC (IC701) turns on the VA and VS Supplies (VA is brought high before VS).

Note: If a voltage is missing, check for proper resistance before proceeding.

Understanding the Power On Sequence when Troubleshooting a possible Power Supply Failure will simplify the process of isolating which circuit board failed to operate properly. In this Section we will investigate the Power on Sequence and examine ways to locate quickly where the failure occurred.

Check the Power On LED for Operation. A Red LED indicates a presence of 5V STB and AC-ON/DETECT. Failure of the Power ON LED to light is an indication of loss of 5V STB or AC ON/ Detect remember the 5V STB and AC-ON/DETECT are developed on the SMPS and sent to the Main board. Check LD703 for Green glow.

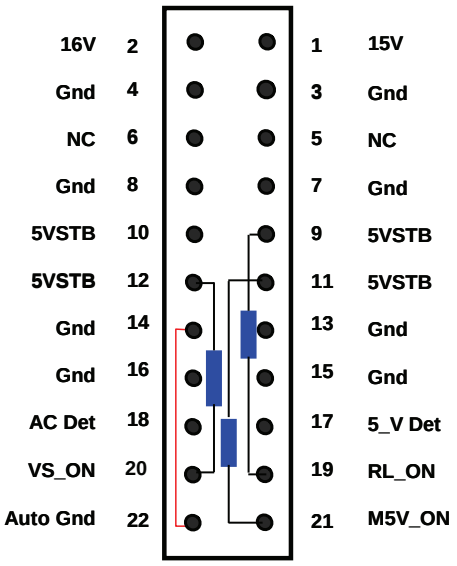
When Power is pressed, look for LD703 to change to Amber. Listen for a Relay Click. The click of the Relay is an indication of RL-ON going high. RL-ON is sent from the Main board to the SMPS and when present, the IC701 controls the relay operation. RL-ON going High and no relay is a failure of the SMPS. RL-ON staying low is a failure of the Main board.

Relay Operation means that the SMPS if working properly will output the 16V Supply to the Main board. This voltage will allow the Tuner, Audio and Video Circuits on the Main board to function, and if connected to an Antenna Input, Audio would be present. If the Relays closed and these supplies failed suspect a problem with the SMPS.

The next step of operation calls for the M5V_ON line from the Main board to the SMPS to go high pin 21 of P813. A high on the M5V_ON line activates the 5V VCC line. Loss of 5V VCC results in no “Raster”, no Display Panel Reset, no Y, Z, Control or X-board operation. Loss of 5V VCC and M5V_ON going high could be caused by any of these boards or failure of the SMPS. M5V_ON staying low indicates a problem on the Main board.

VS-ON is the last step of the Power Sequence and is responsible for bringing the VS and VA voltages up. The VS-ON signal pin 20 of P813 is sent from the Main board to the SMPS as a high, VS and VA and full operation of the Display Panel are now enabled. Loss of VS-ON results in loss of VA and VS and no Raster, no Panel Display Reset but audio would be present. If VS-ON went high and VS and VA where missing the problem

could be caused by a failure on the SMPS or a circuit using these voltages. A resistance check should narrow the possible failures quickly.



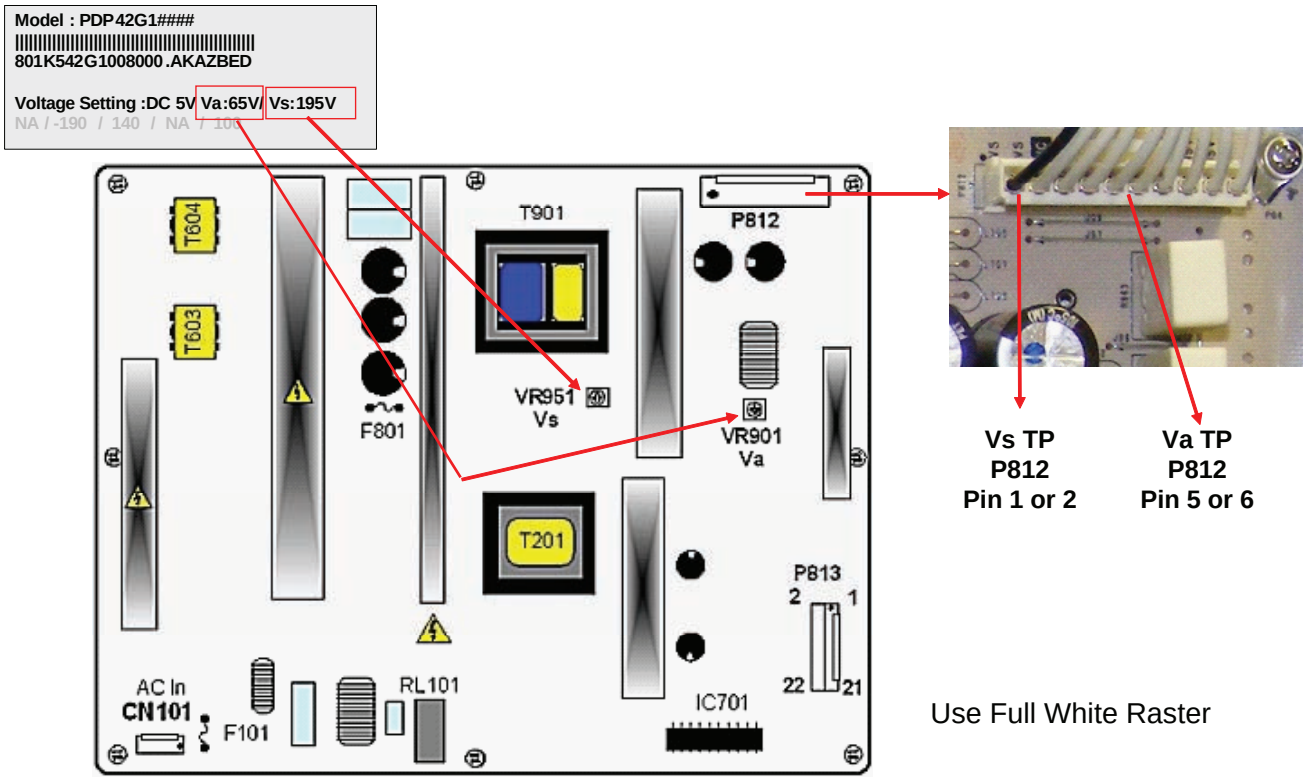
POWER SUPPLY STATIC TEST

This test can confirm the proper operation of the SMPS without the need to exchange the board.This Power Supply can operate in a No Load State. This means that by applying AC power to SC101 and all other plugs disconnected, this power supply will function. Simply removing P813 (Lower Right Hand Side of the board), will cause the "AUTO" Pin 22 to go high from its normal low state allowing the Power Supply to go to full power on mode when AC Power is Supplied. Be careful after this test and make sure the VA and VS lines have discharged before reconnecting the supply cables.

If the Y-Sus and Z-Sus boards are working normal, "Display Panel Reset" will be visible when the SMPS comes up to full power. Shorting the Auto Pattern Gen. test points at this time should result in test patterns on the screen.

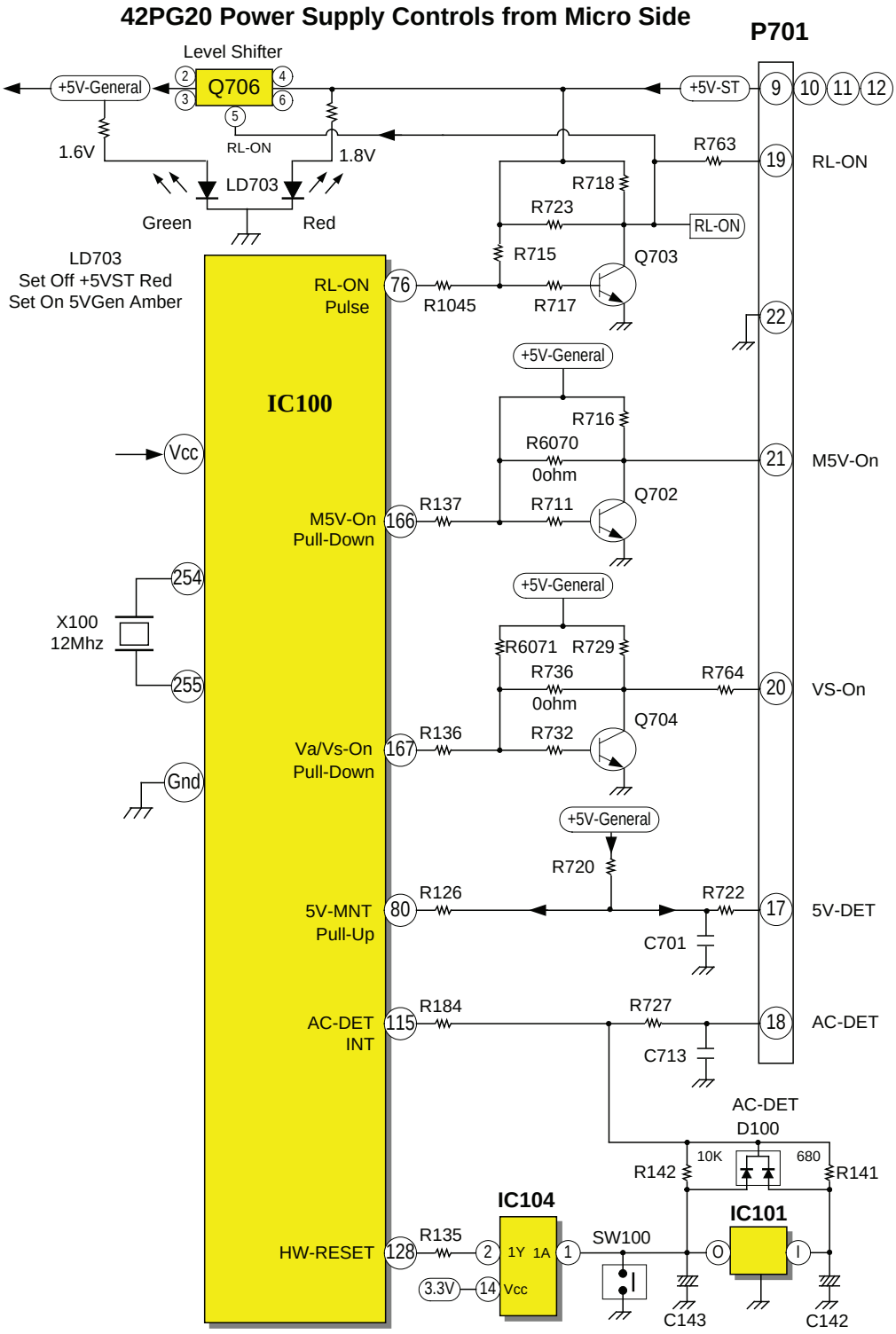
VS/VA ADJUSTMENTS

This Power Supply will come up and run with "no" load (P812 pulled). Pull P813, apply AC power, and the Power Supply starts. Y-Sus/Z-Sus runs "Yes" both Y and Z waveforms.



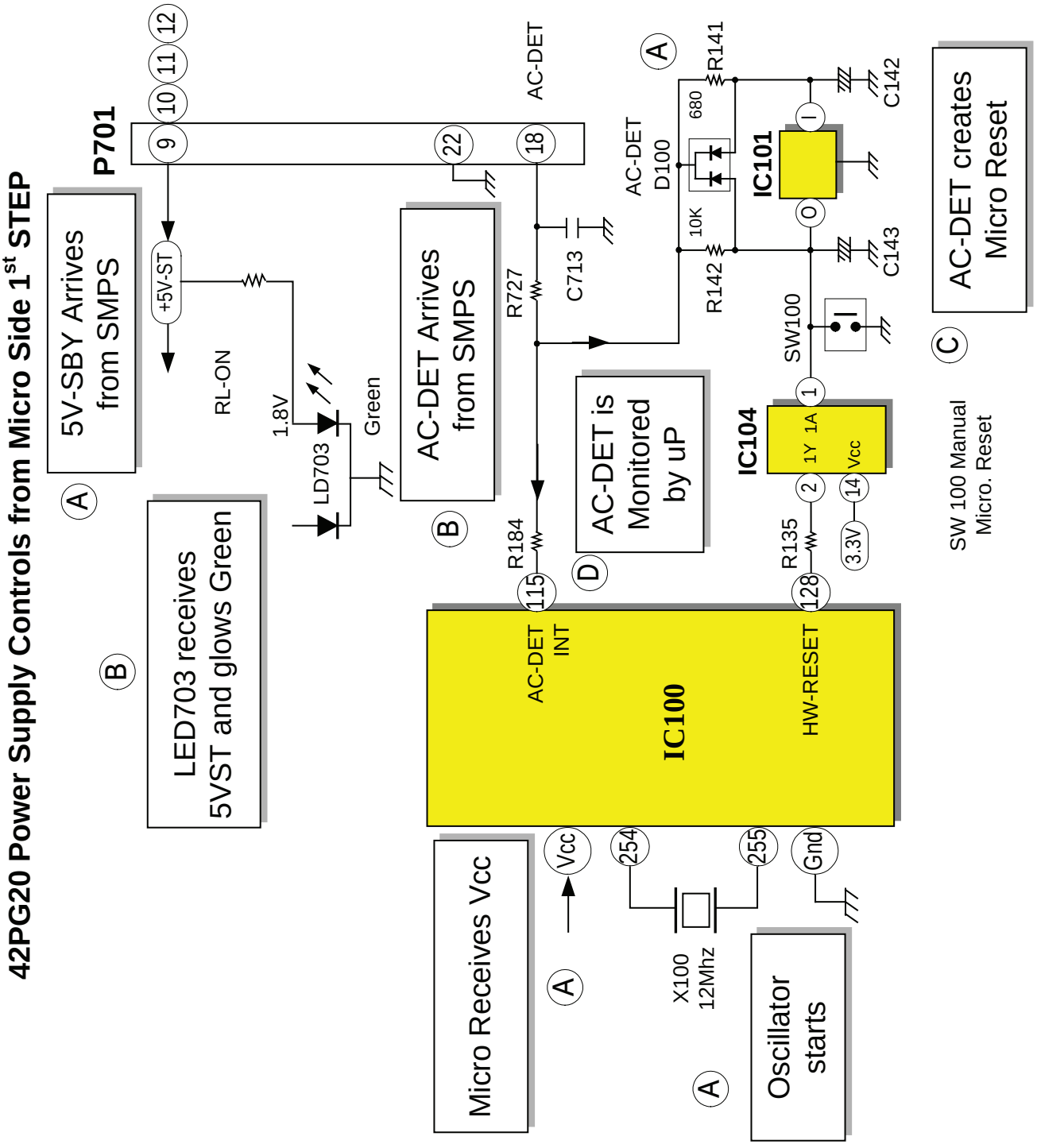
Use Full White Raster

MICRO POWER SUPPLY CONTROL

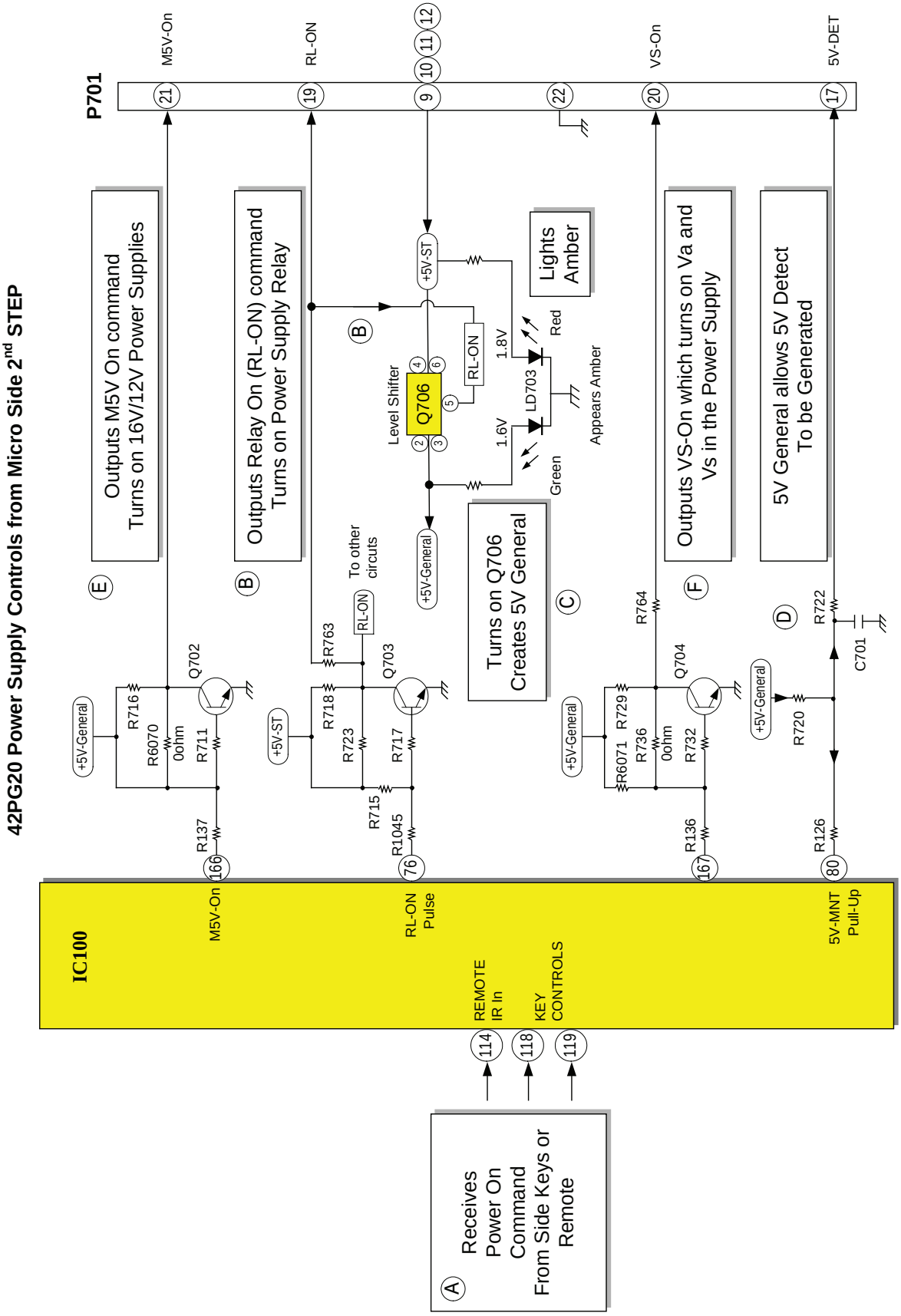


CIRCUIT DESCRIPTIONS

MICRO POWER SUPPLY CONTROL - STEP1



MICRO POWER SUPPLY CONTROL - STEP2



PIN VOLTAGES

P701 "Main" to P813 "SMPS"

Pin	Label	STBY	Run	No Load	Diode	Pin	Label	STBY	Run	No Load	Diode
1	15V	0V	16.5V	16.5V	3.8V	2	15V	0V	16.5V	16.5V	2.82V
3	Gnd	Gnd	Gnd	Gnd	Gnd	4	Gnd	Gnd	Gnd	Gnd	Gnd
5	NC	NC	NC	NC	Open	6	NC	NC	NC	NC	Open
7	Gnd	Gnd	Gnd	Gnd	Gnd	8	Gnd	Gnd	Gnd	Gnd	Gnd
9	5V	5V	5V	5V	0.75V	10	5V	5V	5V	5V	0.75V
11	5V	5V	5V	5V	0.75V	12	5V	5V	5V	5V	0.75V
13	Gnd	Gnd	Gnd	Gnd	Gnd	14	Gnd	Gnd	Gnd	Gnd	Gnd
15	Gnd	Gnd	Gnd	Gnd	Gnd	16	Gnd	Gnd	Gnd	Gnd	Gnd
17	5_V Det	.15V	5V	5V	3.25V	18	AC Det	5V	5V	5V	Open
19	RL_On	0V	3.73V	0V	Open	20	Vs_On	0V	3.2V	0V	1.22V
21	M5V_ON	3.27V	3.24V	0V	1.22V	22	AUTO	Gnd	Gnd	5V	Gnd

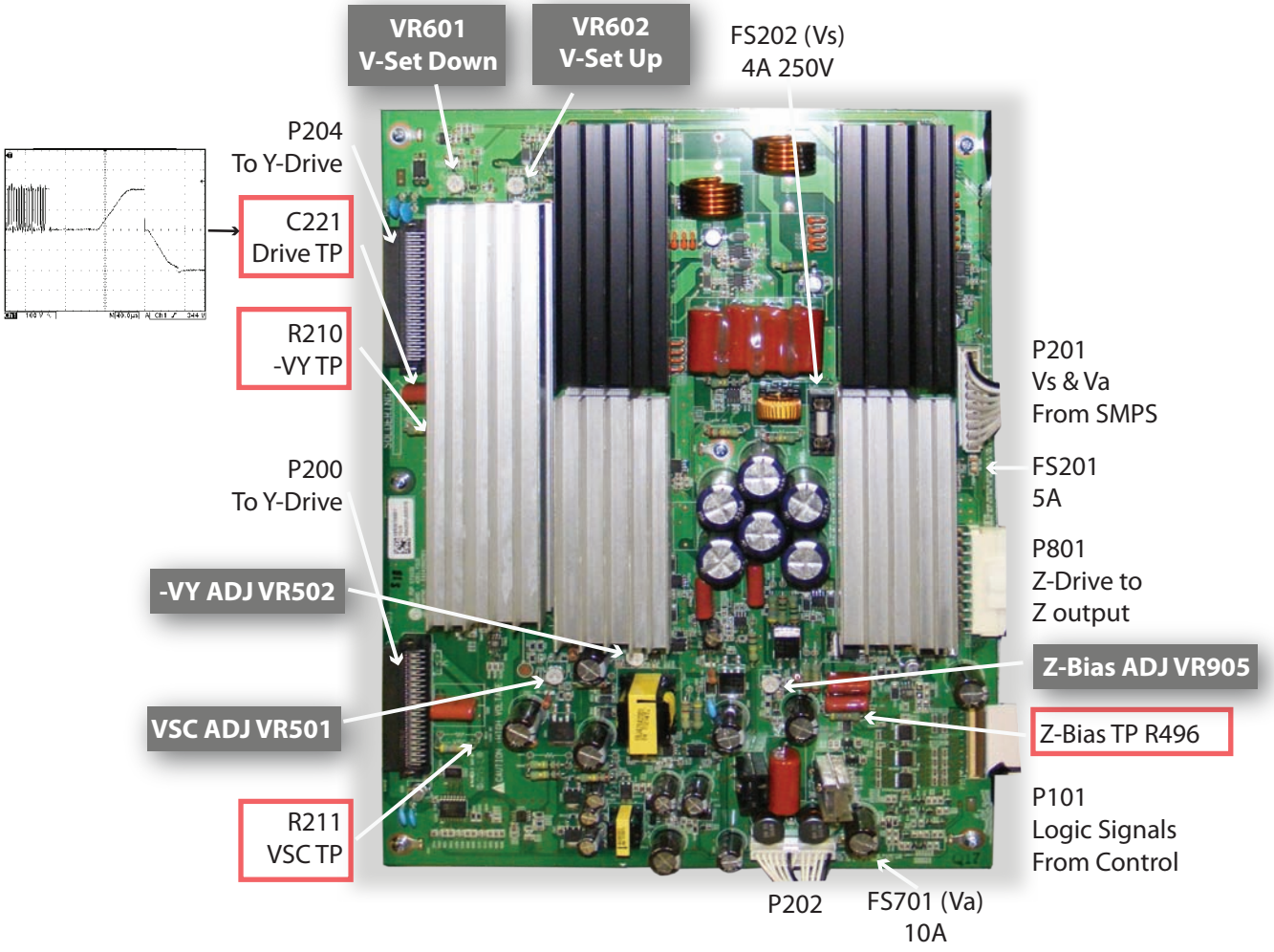
P812 "Power Supply" to P201 "Y-Sus"

Pin	Label	Standby	Run	Diode Mode
1	Vs	0V	*194V	Open
2	Vs	0V	*194V	Open
3	NC	NC	NC	NC
4	Gnd	0V	0V	Gnd
5	Gnd	0V	0V	Gnd
6	Va	0V	*65V	Open
7	Va	0V	*65V	Open
8	Gnd	0V	0V	Gnd
9	M5V	0V	5V	.83V
10	M5V	0V	5V	.83V

CN101 "Power Supply" from AC In

Pin	Standby	Run	Resistance
1	120VAC	120VAC	480K
2	N/C	-	-
3	120 VAC	120VAC	480K

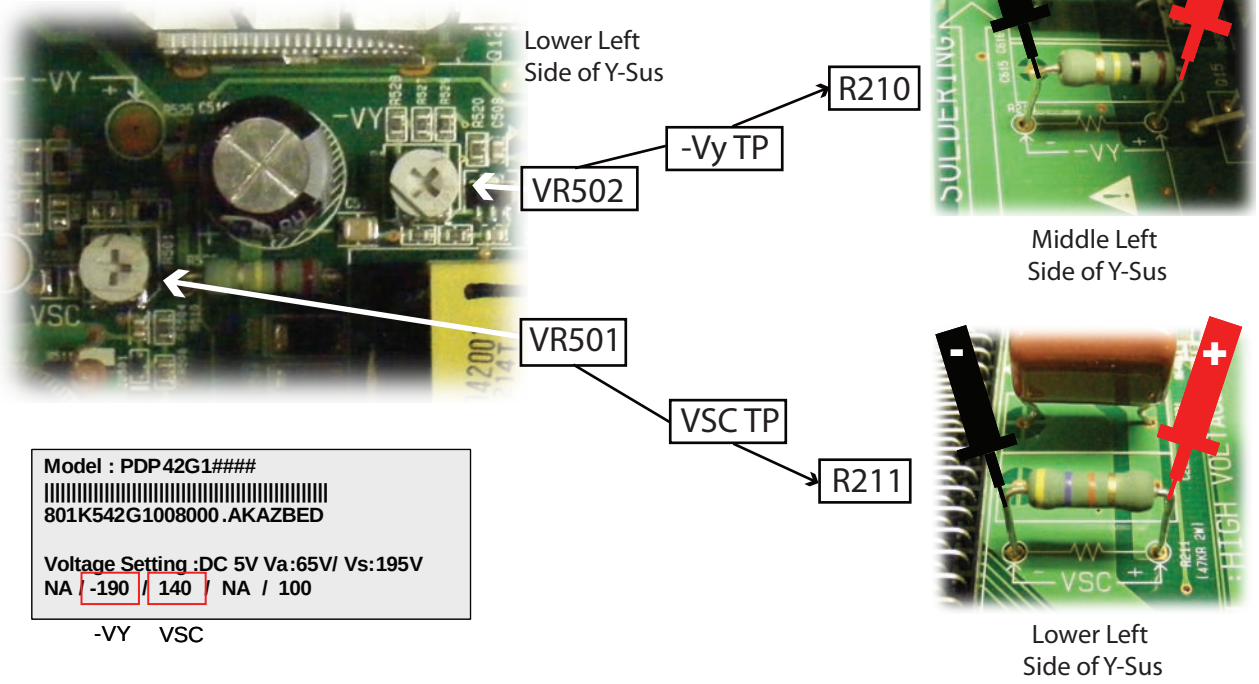
Y-SUS BOARD



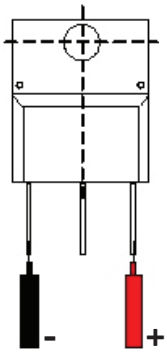
SMPS Outputs		
Board	Voltage	
SMPS	VS	Supplies the Horizontal Grid
	VA	Supplies the Vertical Grid
	VCC 5V	5V Supplies Bias to Y/Z-Sus, Control, and X-Boards
Developed on Y/Z-Sus	-VY	-VY Sets the Negative excursion of the Y SUS Drive Waveform
	V-Set Up VR602	Ramp UP sets Pitch of the Top Ramp of the Drive Waveform
	V-Set Down VR601	V Set Down sets the Pitch of the Bottom Ramp of the Drive Waveform
	16V	To the X-Drives and TCP ICs
	VSC	VSC Set the amplitude of the complex waveform

VSC AND -VY ADJUSTMENTS

Set should run for 15 minutes, this is the "Heat Run" mode. Set screen to White Wash mode or 100IRE White input. Adjust –Vy to 190V (+/- 1V). Adjust VSC to 140 (+/- 1V).

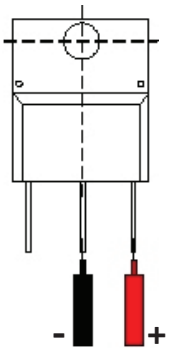


Y-SUS OUTPUT FETS



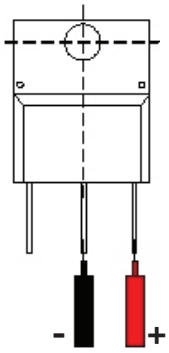
30F122

Forward 0.5V ~ 0.7V
Reverse: OL



30F122

Forward 0.4V ~ 0.5V
Reverse: OL

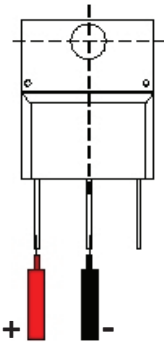


RF2001

Forward 0.3V ~ 0.5V
Reverse: OL

45F123

Forward 0.3V ~ 0.5V
Reverse: OL



RF2001

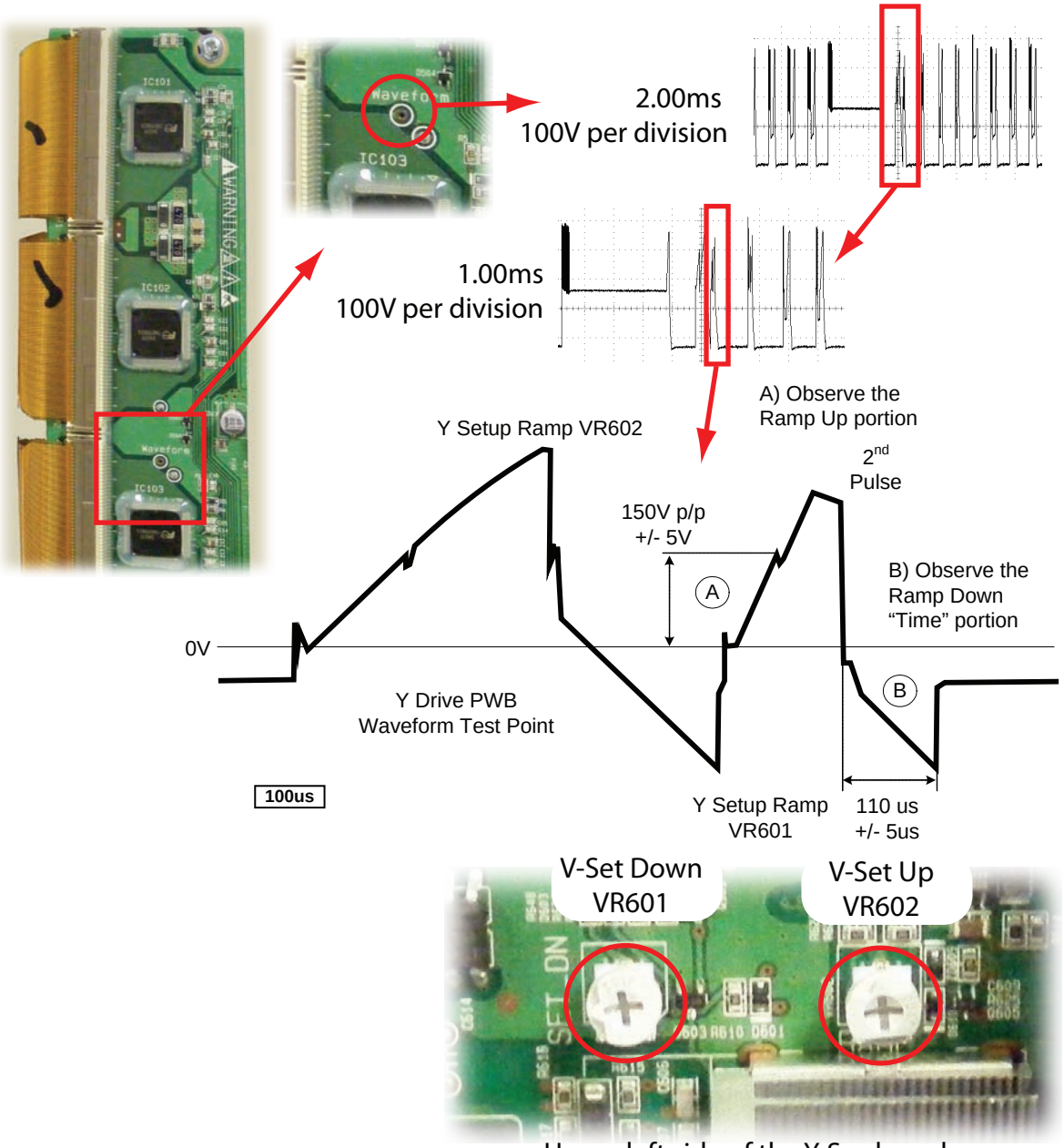
Forward 0.3V ~ 0.5V
Reverse: OL

45F123

Forward 0.9V ~ 1.0V
Reverse: OL

V-SET UP AND V-SET DOWN ADJUSTMENTS

VSC and –VY Must have already been completed. Observe the Picture while making these adjustments. Normally, they do not have to be done.



Upper left side of the Y-Sus board

V-SET UP AND V-SET DOWN ADJUSTMENTS

Fig1 top shows the Y-Drive Waveform signal locked in at 4ms per/div. The signal for Vsetup is outlined within the Waveform.

At 400uSec per/division, the Fig1 lower waveform shows Vsetup isolated.

Fig2 top is 2ms per/division. The signal for Vsetup is now easier to recognize and is outlined within the Waveform.

At 100uSec per/division, the Fig2 lower waveform shows Vsetup isolated.

At 1ms per/division, the signal for Vsetup is now clearly visible. It is outlined within the Fig 3 top waveform.

At 40uSec per/division in Fig3 lower, the adjustment for Vsetup can be made.

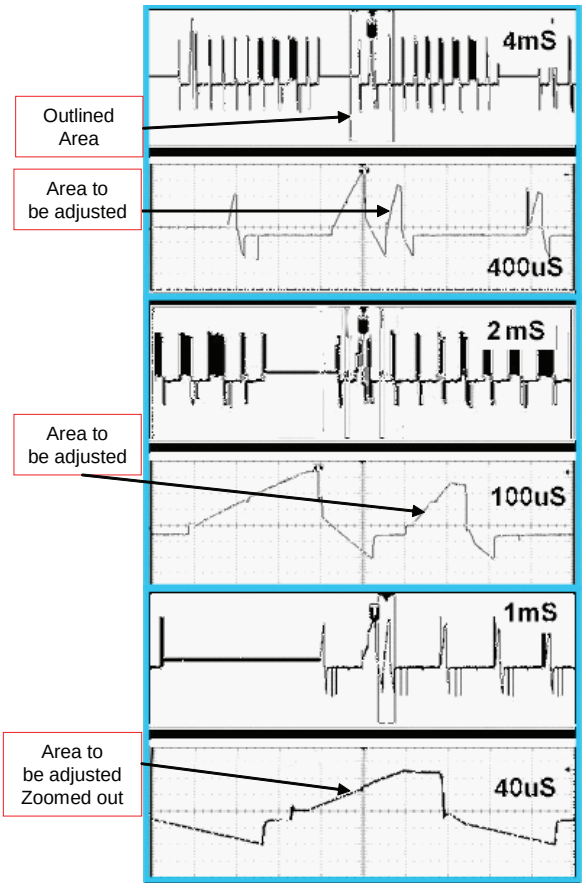


Fig4 top shows the signal locked in at 4ms per/div and the outlined signal for Vsetdn.

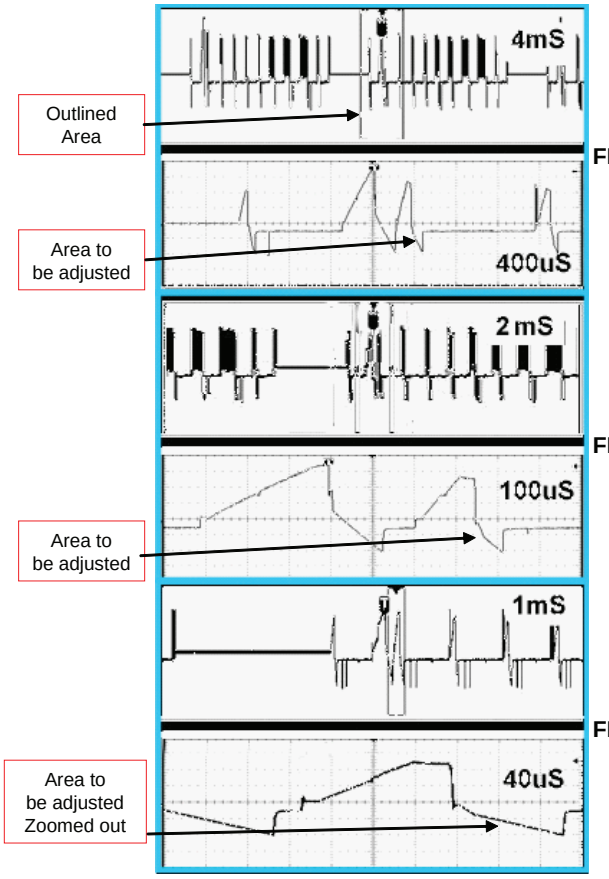
At 400uSec per/division, Fig4 lower waveform shows Vsetdn isolated.

At 2ms per/divison as in Fig5 top, the outlined signal for Vsetdn is now easier to recognize.

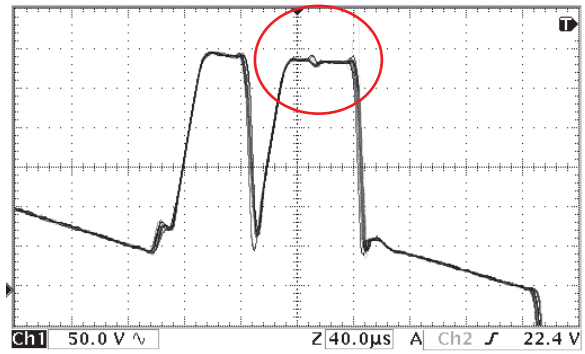
At 100uSec per/division, Fig5 lower waveform shows Vsetdn isolated.

At 1ms per/division the outlined signal for Vsetdn is now clearly visible in Fig6 top.

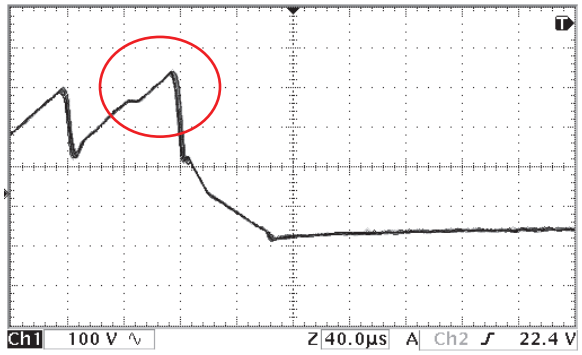
At 40uSec per/division as in Fig6 lower, the adjustment for Vsetdn can be made.



V-SET UP TOO HIGH OR LOW

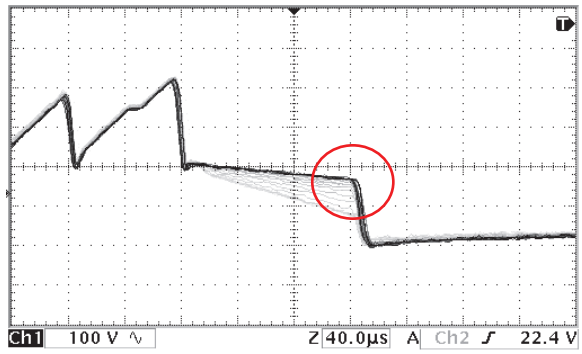


V-Set Up Too High

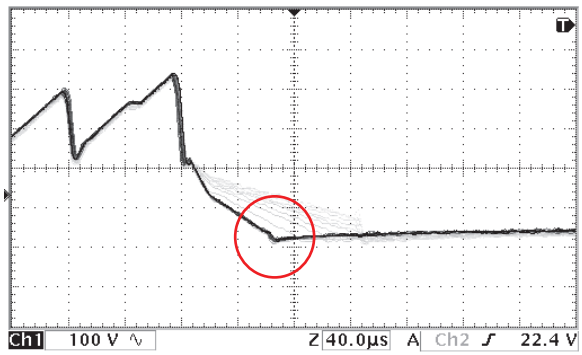


V-Set Up Too Low

V-SET DOWN TOO HIGH OR LOW



V-Set Down Too High



V-Set Down Too Low

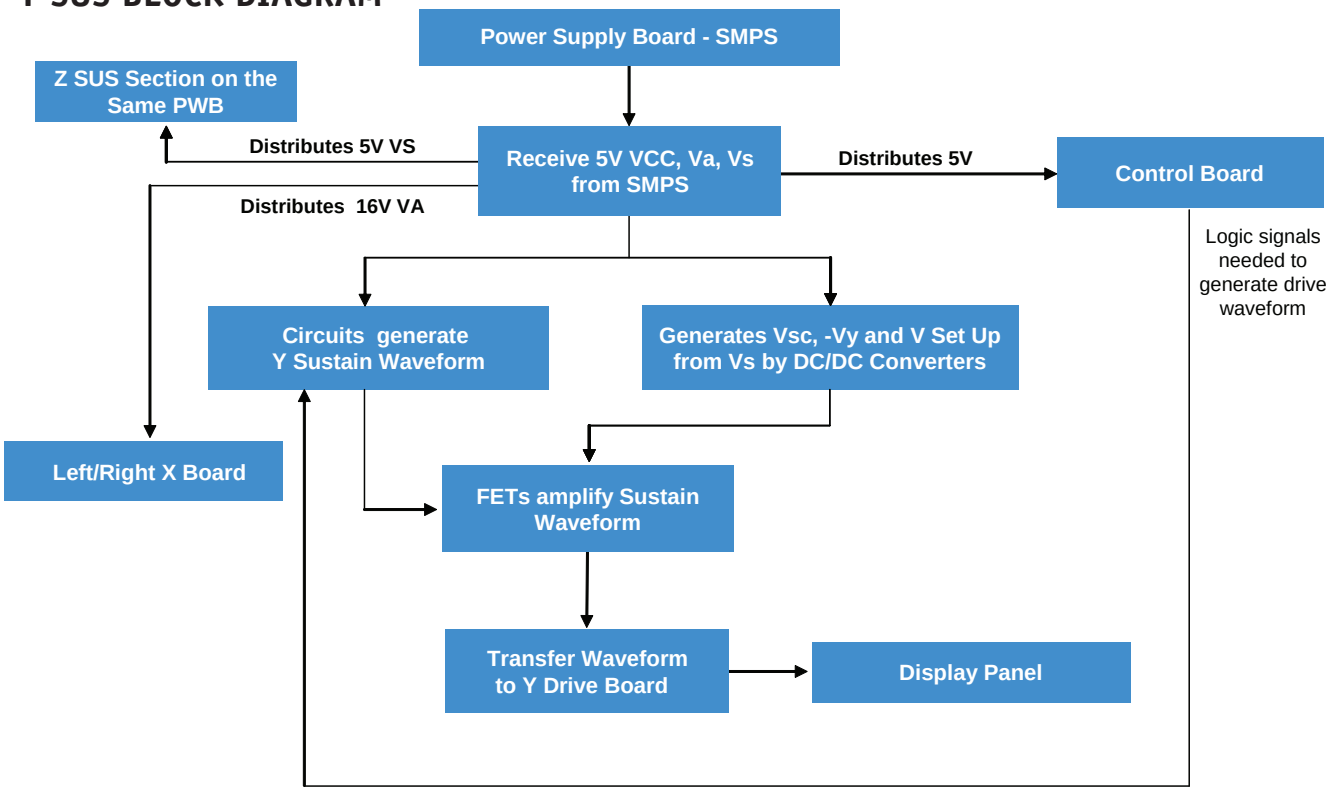
The center begins to wash out and arc due to Vset UP peeking too late and alters the start of the Vset DN phase.

Very little alteration to the picture, the wave form indicates a distorted Vset UP. The peek widens due to the Vset UP peeking too quickly.

All of the center washes out due to increased Vset_DN time.

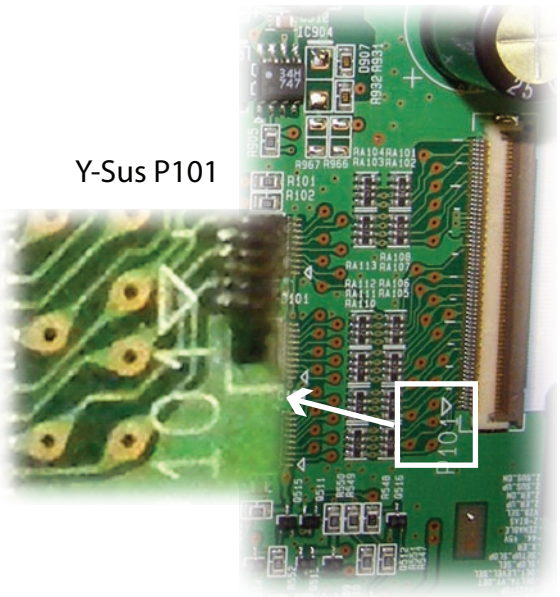
The center begins to wash out and arc due to decreased Vset DN time.

Y-SUS BLOCK DIAGRAM



Y-SUS P101 TO CONTROL P160

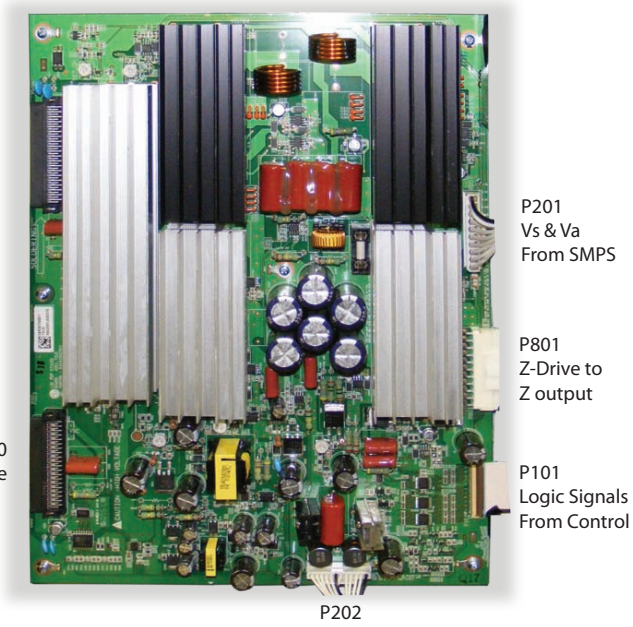
These connector pins are too close to read without possible damage to the board. It's a 60 Pin connector but only has labels 1-19 on the Control board. Looking closely, these test points are "every other pin". The bottom TP represents the "19" label on the Control board. Pin 1 on the Y-Sus board is actually pin 60 on the Control board side. Take resistance readings with the board disconnected using the Diode mode on a digital volt meter. However, this connector has many more pins than shown on the Control board Labeling. Roughly 39 pins



P101 "Y-Sus" to P160 "Control"

Pin	Label	STBY	Run	Diode Mode	Pin	Label	STBY	Run	Diode Mode	Pin	Label	STBY	Run	Diode Mode
1	Gnd	Gnd	Gnd	Gnd	21	Gnd	Gnd	Gnd	Gnd	41	5V	OV	4.75V	0.76V / (1.7K)
2	CLK	0V	3.2V	2.87V	22	Set_DN2	0V	0.2V	2.87V	42	5V	OV	4.75V	0.76V / (1.7K)
3	Gnd	Gnd	Gnd	Gnd	23	Gnd	Gnd	Gnd	Gnd	43	5V	OV	4.75V	0.76V / (1.7K)
4	STB	0V	0.76V	2.87V	24	PASS_TOP	0V	0.2V	2.87V	44	5V	OV	4.75V	0.76V / (1.7K)
5	Gnd	Gnd	Gnd	Gnd	25	Gnd	Gnd	Gnd	Gnd	45	n/c	n/c	n/c	n/c
6	OSC1	0V	0V	2.87V	26	DELTA_Vy	0V	0.16V	2.87V	46	n/c	n/c	n/c	n/c
7	Gnd	Gnd	Gnd	Gnd	27	Gnd	Gnd	Gnd	Gnd	47	Z-ENABLE	0V	0V	1.25V
8	OSC2	0V	3V	2.87V	28	DET_LEVEL	0V	0V	2.87V	48	Gnd	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd	Gnd	29	Gnd	Gnd	Gnd	Gnd	49	Z-BIAS	0V	1.71V	1.1V
10	DATA	0V	0.6V	2.87V	30	SLOPE_RETE	0V	0V	2.87V	50	Gnd	Gnd	Gnd	Gnd
11	Gnd	Gnd	Gnd	Gnd	31	Gnd	Gnd	Gnd	Gnd	51	VZB-SEL	0V	0V	1.1V
12	SUS_DN	0V	0V	2.87V	32	SET_UP	0V	1.9V	2.87V	52	Gnd	Gnd	Gnd	Gnd
13	Gnd	Gnd	Gnd	Gnd	33	Gnd	Gnd	Gnd	Gnd	53	Z-ER_UP	0V	1.25V	1.1V
14	SUS_UP	0V	2V	2.87V	34	Set_DN_2	0V	1.4V	2.87V	54	Gnd	Gnd	Gnd	Gnd
15	Gnd	Gnd	Gnd	Gnd	35	Gnd	Gnd	Gnd	Gnd	55	Z-ER_DN	0V	1.35V	1.1V
16	ER_DN	0V	1.2V	2.87V	36	X_ER	0V	2.9V	2.87V	56	Gnd	Gnd	Gnd	Gnd
17	Gnd	Gnd	Gnd	Gnd	37	Gnd	Gnd	Gnd	Gnd	57	Z-Sus_UP	0V	0.35V	1.1V
18	ER_UP	0V	2V	2.87V	38	Y-Enable	0V	0.6V	2.87V	58	Gnd	Gnd	Gnd	Gnd
19	Gnd	Gnd	Gnd	Gnd	39	n/c	n/c	n/c	n/c	59	Z-Sus_DN	0V	1.15V	1.1V
20	SET_UP	0V	0.26V	2.87V	40	5V	OV	4.75V	0.76V / (1.7K)	60	Gnd	Gnd	Gnd	Gnd

Y-SUS CONNECTIONS



"Y-Sus" P801 to "Z-Drive" P1				
Pin	Label	Standby	Run	Diode Mode
1	+Vs	0V	*194V	Open
2	Gnd	Gnd	Gnd	Gnd
3	ZSUS	0V	70.46V	Open
4	Gnd	Gnd	Gnd	Gnd
5	ZSUS	0V	70.46V	Open
6	Gnd	Gnd	Gnd	Gnd
7	ZSUS	0V	70.46V	Open
8	Gnd	Gnd	Gnd	Gnd
9	ZSUS	0V	70.46V	Open
10	Gnd	Gnd	Gnd	Gnd
11	ZSUS	0V	70.46V	Open

Note: Voltages will vary in accordance with Panel Label

P202 "Y-Sus" to "X-Drive Left" P242				
Pin	Label	Standby	Run	Diode Mode
1	Gnd	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd	Gnd
3	15V	0V	15.8V	1V
4	ER2	0V	61.5V	Open
5	ER2	0V	61.5V	Open
6	Va	0V	64.9V	Open
7	Gnd	Gnd	Gnd	Gnd
8	Gnd	Gnd	Gnd	Gnd
9	15V	0V	15.8V	1V
10	ER1	0V	61.5V	Open
11	ER1	0V	61.5V	Open
12	Va	0V	*64.9V	Open

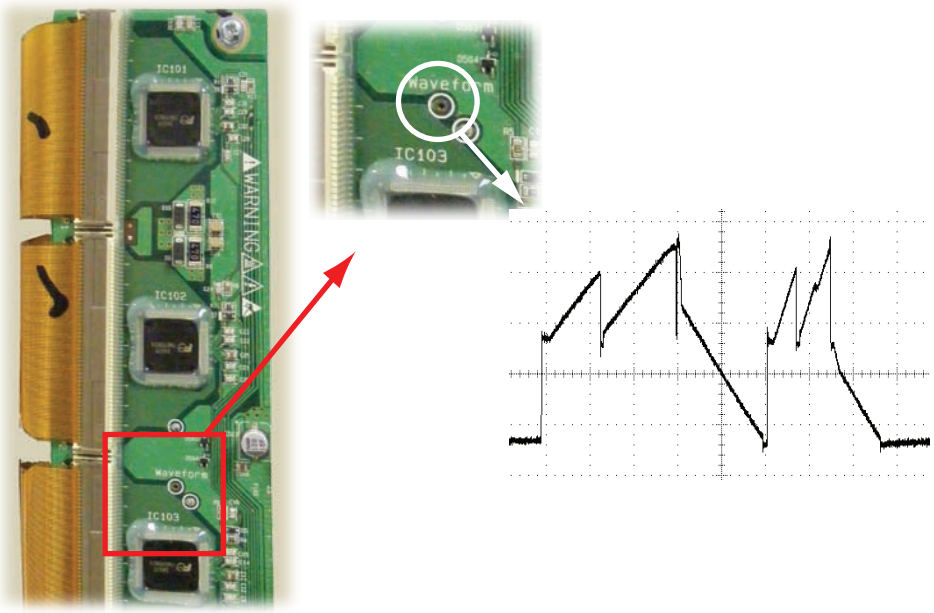
Note: Voltages will vary in accordance with Panel Label

P201 "Y-Sus" to "Power Supply" P812				
Pin	Label	Standby	Run	Diode Mode
1	Vs	0V	*194V	Open
2	Vs	0V	*194V	Open
3	NC	NC	NC	NC
4	Gnd	0V	0V	Gnd
5	Gnd	0V	0V	Gnd
6	Va	0V	*65V	Open
7	Va	0V	*65V	Open
8	Gnd	0V	0V	Gnd
9	M5V	0V	5V	.83V
10	M5V	0V	5V	.83V

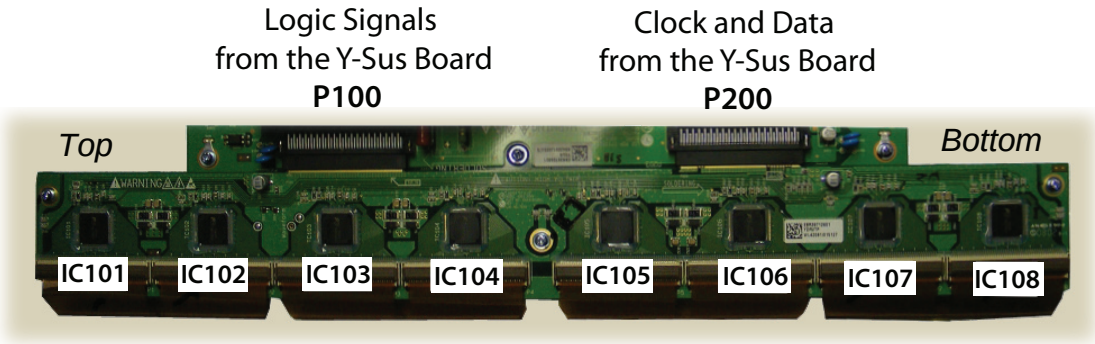
Note: Voltages will vary in accordance with Panel Label

Y-DRIVE BOARD

Y-Drive board works as a path supplying the Sustain and Reset waveforms which are made in the Y-Sustain board and sent to the panel through scan driver IC's. The Y-Drive boards supply a waveform which selects the horizontal electrodes sequentially. The 42PG20 uses 8 driver ICs on 1 Y-Drive board.



5 Volts and Logic Signals from Y-Sus board are supplied to the Drive board on connector P200. Logic Signals are from P100. The 5V supply is underneath the board.



REMOVING RIBBON CABLES

To remove the Ribbon Cable from the connector, first carefully lift the Locking Tab from the back and tilt it forward (lift from under the tab as shown in Fig 1). The locking tab must be standing straight up as shown in Fig 2. Lift up the entire Ribbon Cable gently to release the Tabs on each end. (See Fig 2) Gently slide the Ribbon Cable free from the connector. To reinstall the Ribbon Cable, carefully slide it back into the slot see (Fig 3), be sure the Tab is seated securely and press the Locking Tab back to the locked position see (Fig 2 then Fig 1).

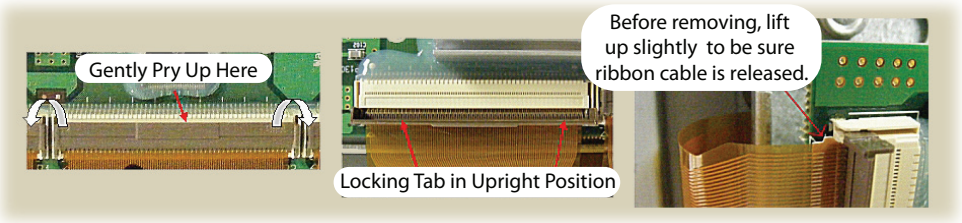
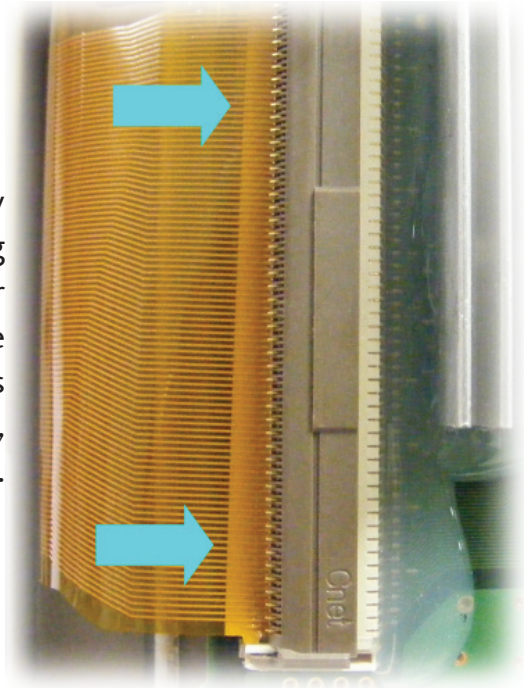


Fig 1 Fig 2 Fig 3

INCORRECT INSTALL

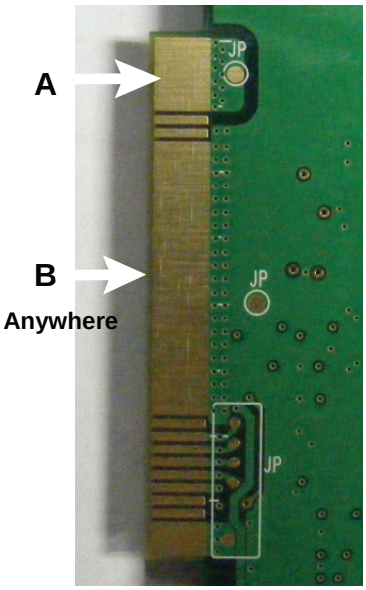
In the image to the right, the ribbon cable is improperly seated into the connector. You can tell by observing the linearity. The Locking Tab will offer a greater resistance to closing in this case. Note that the cable is crooked. In this case the tab on the ribbon cable was improperly seated at the bottom. This can cause bars, lines, intermittent lines abnormalities in the picture. Remove the ribbon cable and re-seat it correctly.



Y-DRIVE BUFFER TROUBLESHOOTING

Using the "Diode Test" on the DVM, check the pins for shorts or abnormal loads. You can check all 8 buffer ICs using this procedure. Using the "Diode Test" on a digital volt meter, check the pins for shorts or abnormal loads. Any of the output lugs can be tested. Look for shorts indicating a defective Buffer IC.

BACK SIDE OF Y-DRIVE



FORWARD

BLACK LEAD ON A

RED LEAD ON "B" READING 0.73 V

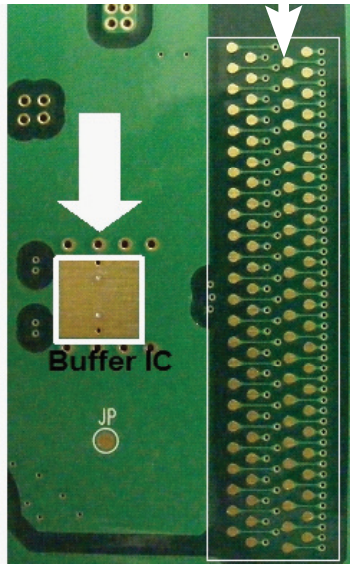
REVERSE

RED LEAD ON A

BLACK LEAD ON "B" READING "OPEN"

BACK SIDE OF Y-DRIVE PWB

OUTPUT LUGS



RED LEAD ON BUFFER IC

BLACK LEAD ON "ANY" OUTPUT LUG. READING 0.73 V

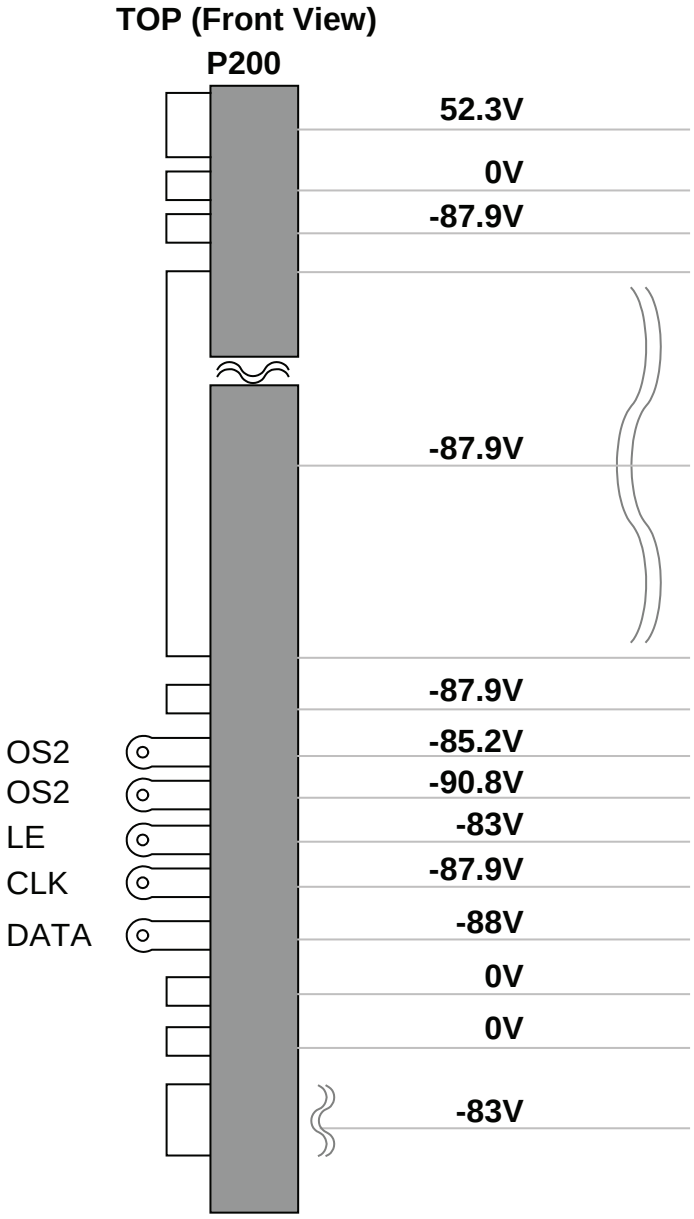
BLACK LEAD ON BUFFER IC

Indicated by Red outline

RED LEAD ON "ANY" OUTPUT LUG. READING "OPEN"

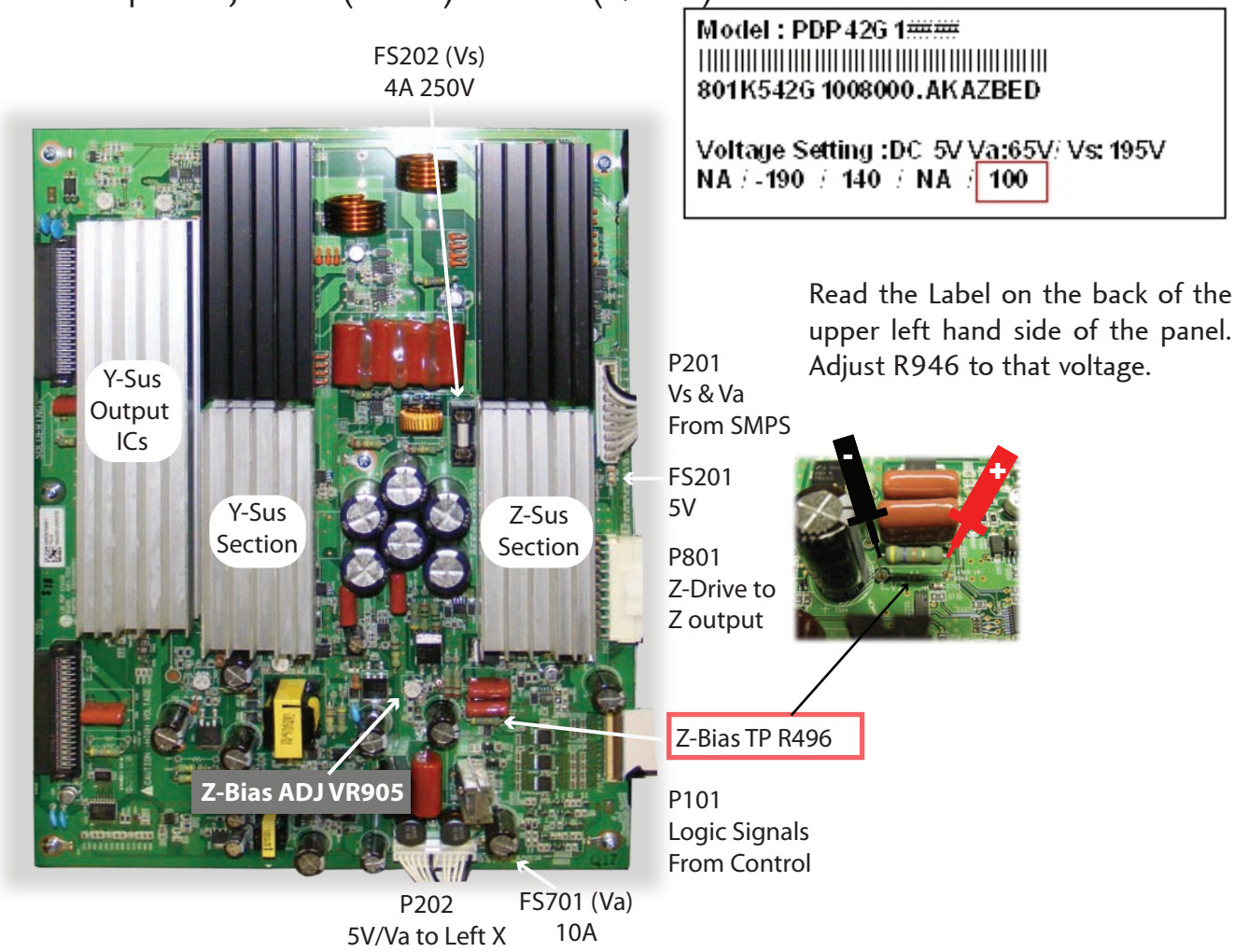
P200 ON THE Y-DRIVE

Voltages taken with unit running and snow as a picture.



Z-BIAS ADJUSTMENT

The Z-Sus Drive section is now located on the Y-Sus board. Set should run for 15 minutes in “Heat Run” mode prior to any adjustments. Set screen to white wash mode or 100IRE White input. Adjust VZ (Z-Bias) to 100V (+/- 1V).

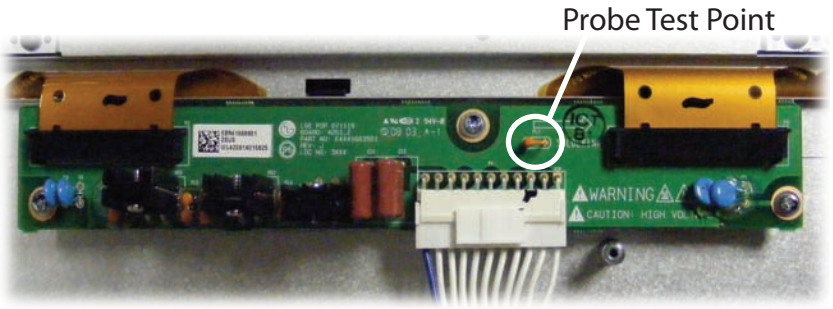


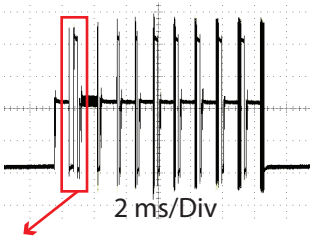
Z-Sus Input Voltages

Board	Voltage	Description
Y-Sus	VS	VS is input at P3 pins 1 and 2 and supplied to the driver IC circuit.
	VA	VA inputs at P3 pins 6 and 7 and supplied to the driver IC circuit.
	M5V VCC	5V in input P3 pins 9 and 10. It is used to Bias the circuits on the Z_ SUS board.
Z-Sus	Z-Bias	Z Bias Voltage is used to Bias the output circuits driving the Sustain and Erase Pulses, removing previous images from the PDP. Z-bias is measured from the Vzb TP on the Z -SUS board and adjusted by VZB Adj.

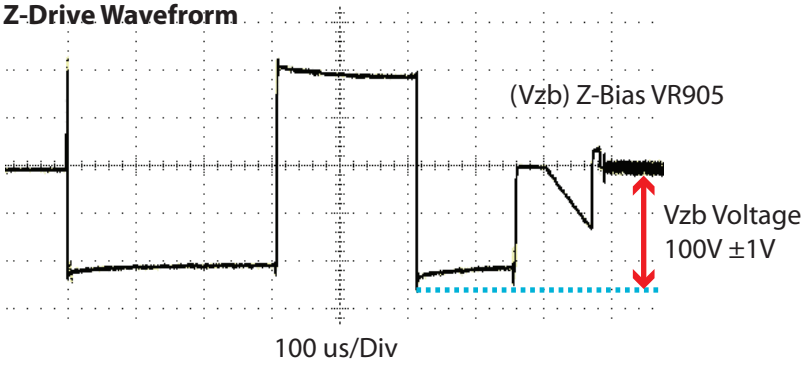
Z-SUS BOARD

Provides the SUSTAIN PULSE and ERASE PULSE for generating SUSTAIN discharge in the panel by receiving Drive signals from the Y/Z-Sus board. This waveform is supplied to the panel through FPC (Flexible Printed Circuit (Z). Z-Bias is a "DC" adjustment. The effects of this adjustment can be observed on the scope looking at the Z-Sus output. This Waveform is just for reference to observe the effects of Zbz adjustment. Note: The Vzb Adjustment is a DC level adjustment.



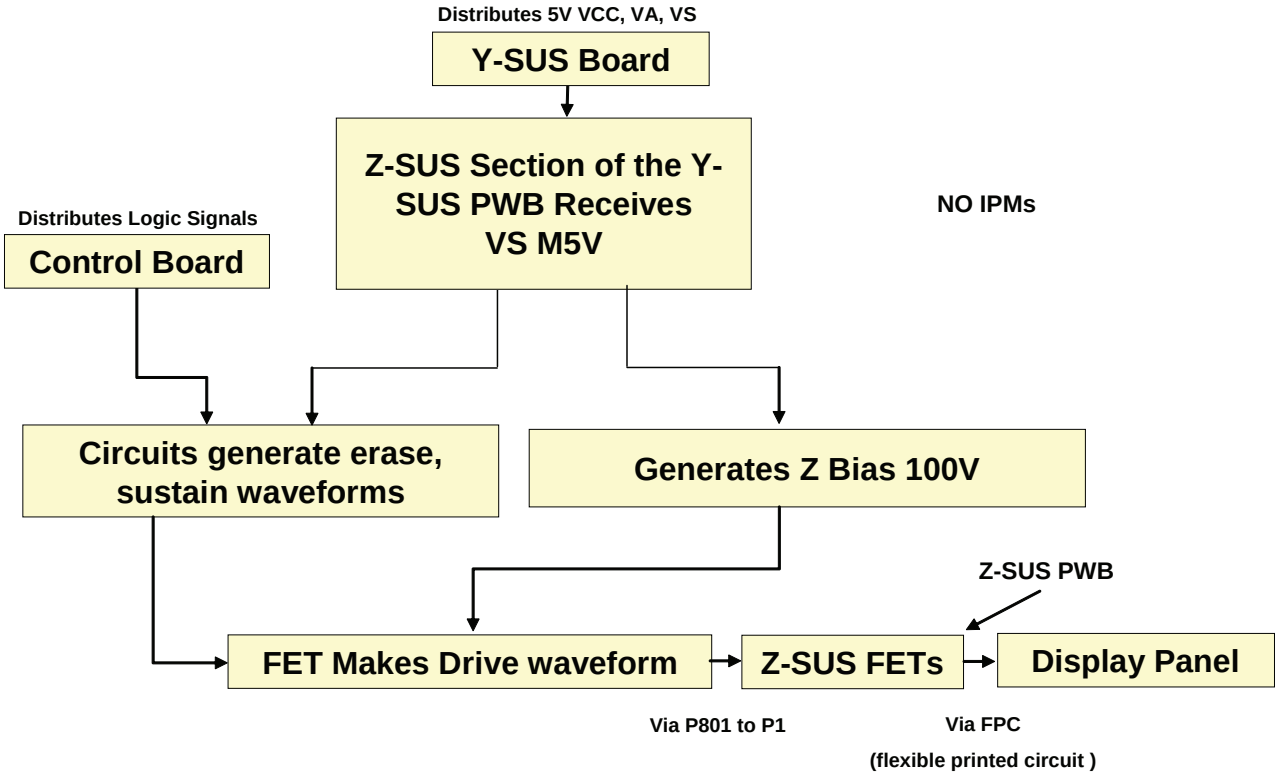


Z-Drive Wavefrom



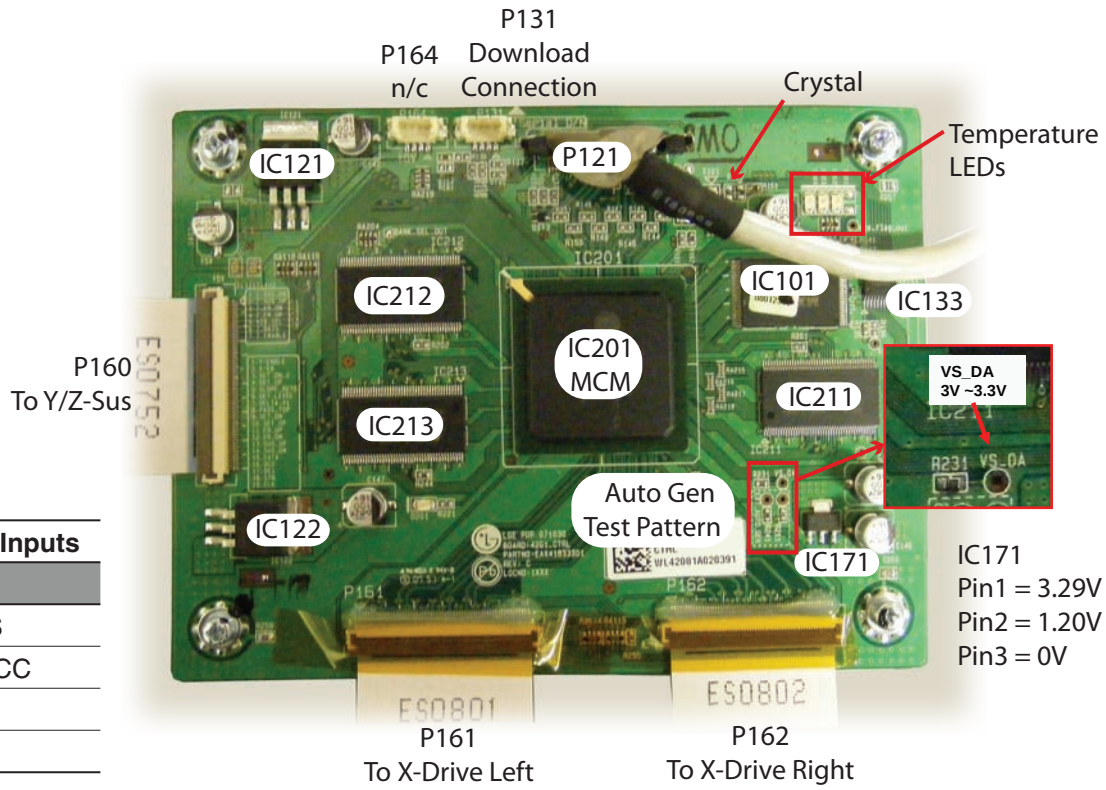
"Y-Sus" P801 to "Z-Drive" P1				
Pin	Label	Standby	Run	Diode Mode
1	+Vs	0V	*194V	Open
2	Gnd	Gnd	Gnd	Gnd
3	ZSUS	0V	70.46V	Open
4	Gnd	Gnd	Gnd	Gnd
5	ZSUS	0V	70.46V	Open
6	Gnd	Gnd	Gnd	Gnd
7	ZSUS	0V	70.46V	Open
8	Gnd	Gnd	Gnd	Gnd
9	ZSUS	0V	70.46V	Open
10	Gnd	Gnd	Gnd	Gnd
11	ZSUS	0V	70.46V	Open

Z-SUS BLOCK DIAGRAM



CIRCUIT DESCRIPTIONS

CONTROL BOARD

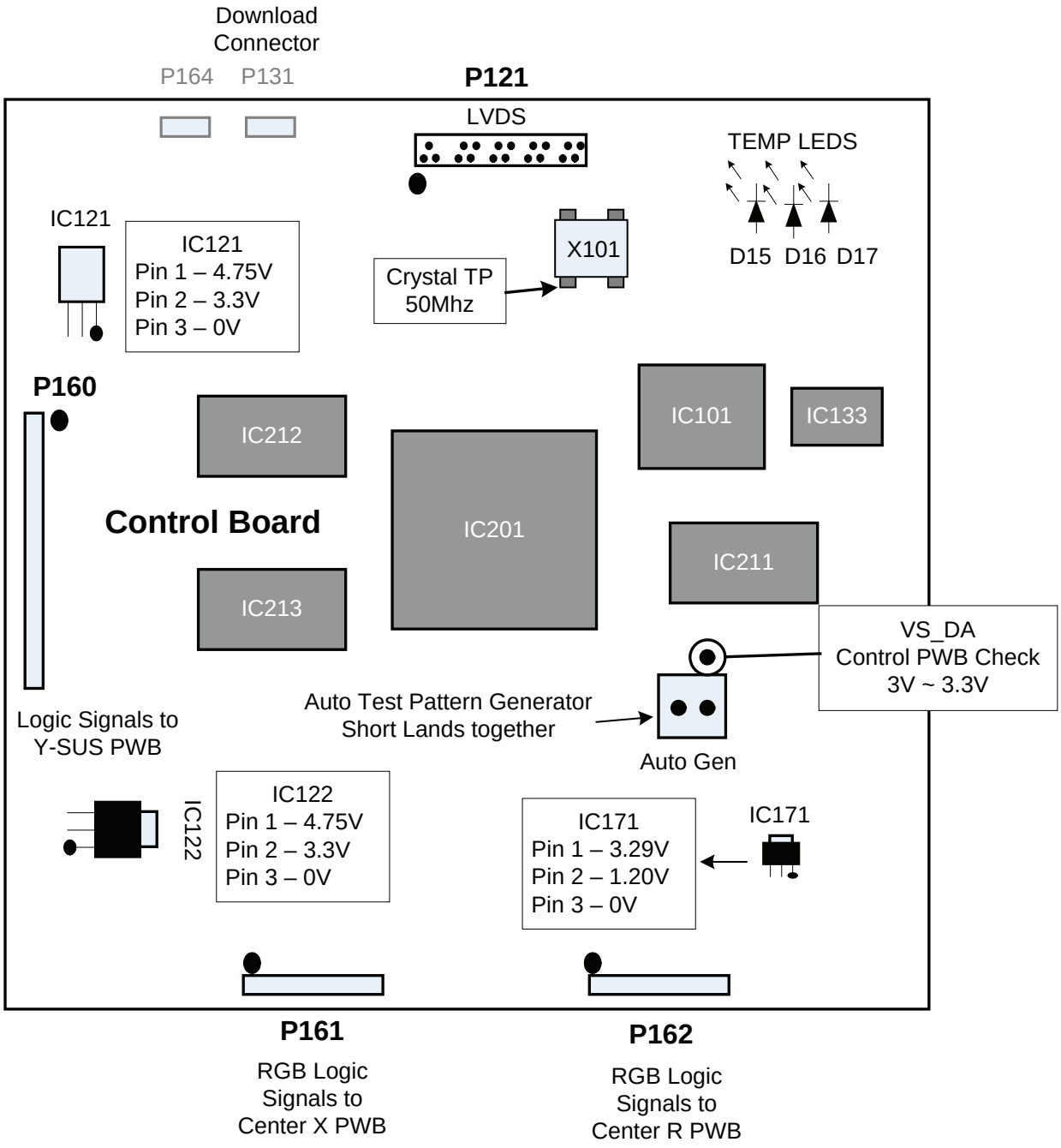


Control board Inputs	
Board	Input
Main	LVDS
Y-Sus	5V VCC
Developed	1.8V
	3.3V

CONTROL BOARD TEST

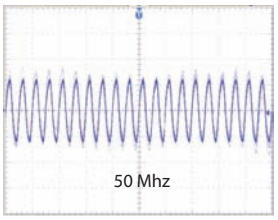
For a quick board test. (All board connectors Disconnected). Jump 5V from Power Supply to IC121 Pin 1. If the Temp LED lights, Pretty much guaranteed, board is OK. When the Television has a problem related to; Shutdown caused by Main board No Picture. This can be checked by disconnecting the Main board from all connectors. Apply AC power. Since P813 is not connected, the set will come on. Short the two pins on the Auto Test Pattern lands.

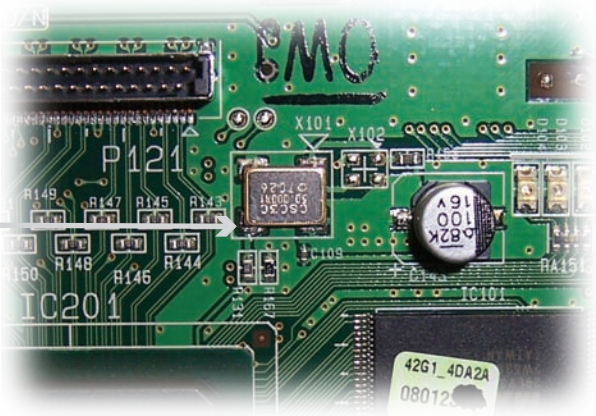
If there is a picture of cycling colors, the Y-Sus, Y-Drive, Z-Sus, Power Supply, Control boards and Panel are all OK. Same test to tell if No Video is caused by the Main board. Quick observation Of Temperature LEDs will tell if the Control board is running. With the unit on. If none of D15, 16, 17 are illuminated. Check supplies to the board. If they are present replace the Control board.



CRYSTAL CLOCK

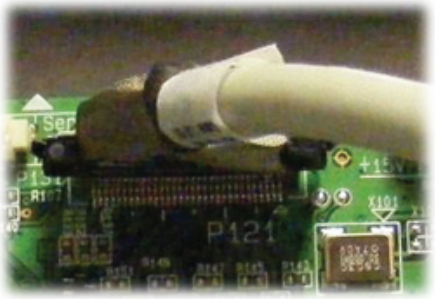
Check the output of the Oscillator package. The frequency of the sine wave is 50 MHZ. Missing this clock signal can halt operation of the unit.



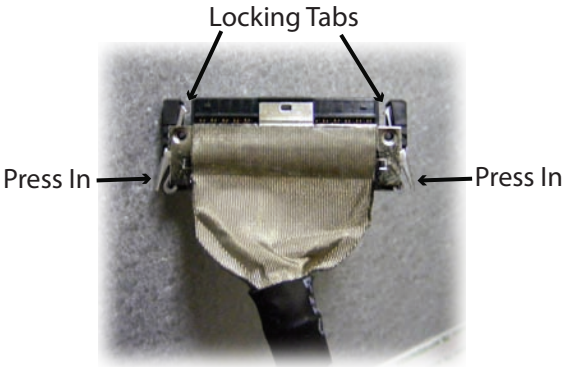


LVDS CABLE

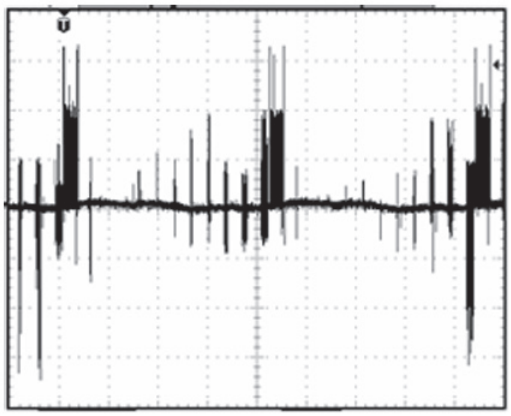
Video Signals from the Main board to the Control board are referred to as Low Voltage Differential Signals or LVDS. Their presence can be confirmed with the Oscilloscope by monitoring the LVDS signals with no input signal selected while pressing the Menu Button on and off with the remote control or keypad. Loss of these signals would confirm the failure is on the Main board.



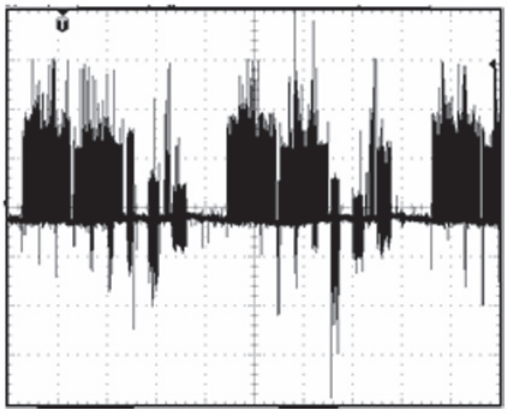
P121 on the Control board shown. Press the two outside tabs inward to release.



Example of Normal Signals measured at 200mv/cm at 5µs/cm.

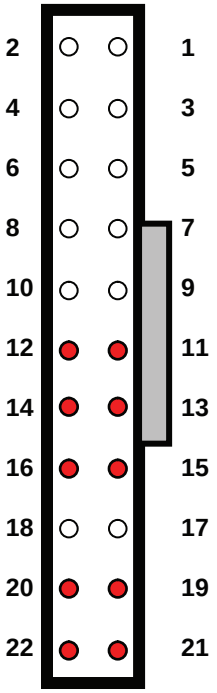


Menu Off



Menu On

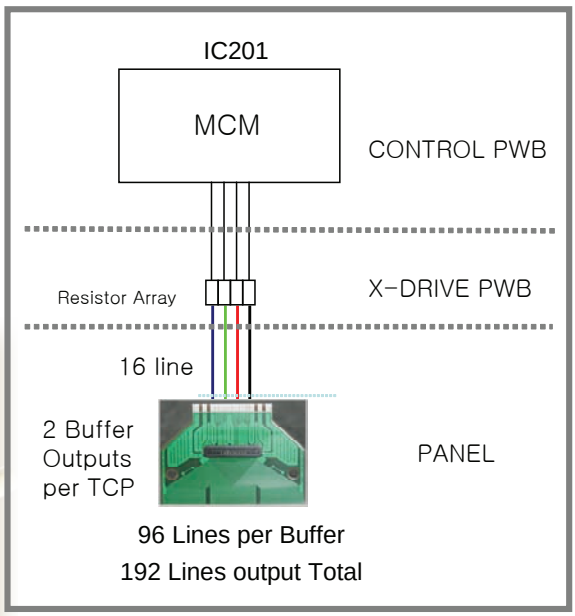
P302 on Main Board

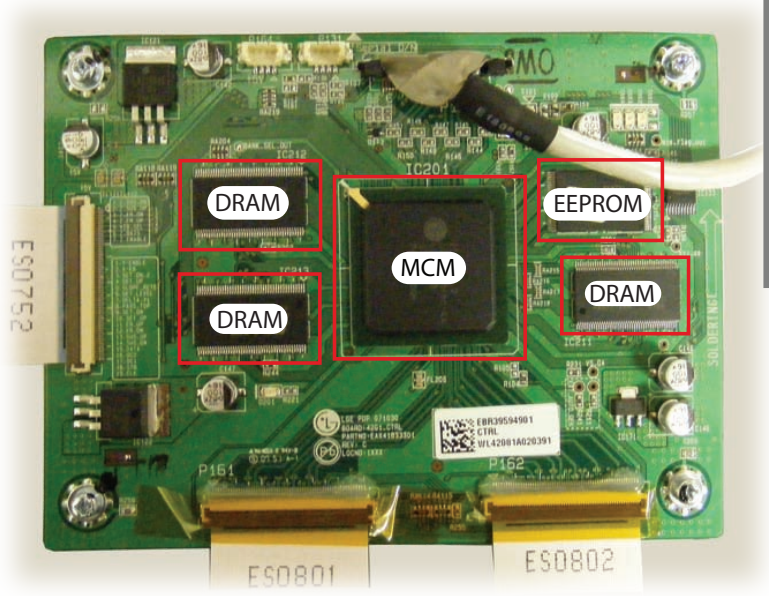


● - indicates signal pins.

CONTROL BOARD SIGNAL BLOCK

The Control board supplies Video Signals to the TCP (Tape Carrier Package) ICs. If there is a bar defect on the screen, it could be a Control board problem. This Picture shows Signal Flow Distribution to help determine the failure depending on where the it shows on the screen.





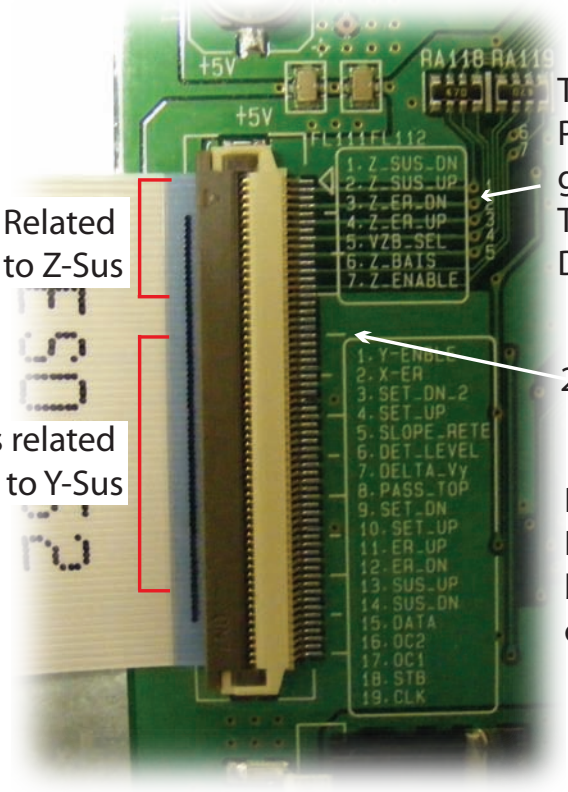
P121 "Control" to P302 "Main"

Pin	Stby	Run	Diode Check	Pin	Stby	Run	Diode Check
1	Gnd	Gnd	Gnd	2	0V	0V	1V
3	0V	0V	1V	4	0V	1.26V	1V
5	0V	1.19V	1V	6	0V	0V	Gnd
7	0V	1.26V	1V	8	0V	1.19V	1V
9	0V	0V	1V	10	0V	0V	1V
11	0V	1.15V	1V	12	0V	1.26V	1V
13	Gnd	Gnd	Gnd	14	0V	0V	Gnd
15	0V	0V	1V	16	0V	0V	1V
17	0V	0V	1V	18	0V	0V	1V
19	Gnd	Gnd	Gnd	20	0V	0.21V	1V
21	0V	0V	1V	22	0.89V	0.56V	2.5V
23	0V	5.29V	2.4V	24	0V	1.26V	1V
25	0V	1.2V	1V	26	Gnd	Gnd	Gnd
27	0V	3.29V	1.3V	28	0.89V	3.29V	Open
29	0.89V	3.29V	Open	30	0V	0V	Open
31	Gnd	Gnd	Gnd				

CONTROL TO Y-SUS

P160 is show below. These pins are very close together, so use caution when taking voltage measurements. This connector is a little confusing in its labeling. It is actually a 60 pin connector. This shows the Pin Labeling that is shown on the silk screening. Remember, this connector has many more pins than the labels indicate. Actual Pin 1 (ground) 2 (Z-Sus-DN) 3 (ground) 4 (Z-Sus-UP) 5 (ground), etc. In other words, there is a ground between each pin except the +5V area.

P160

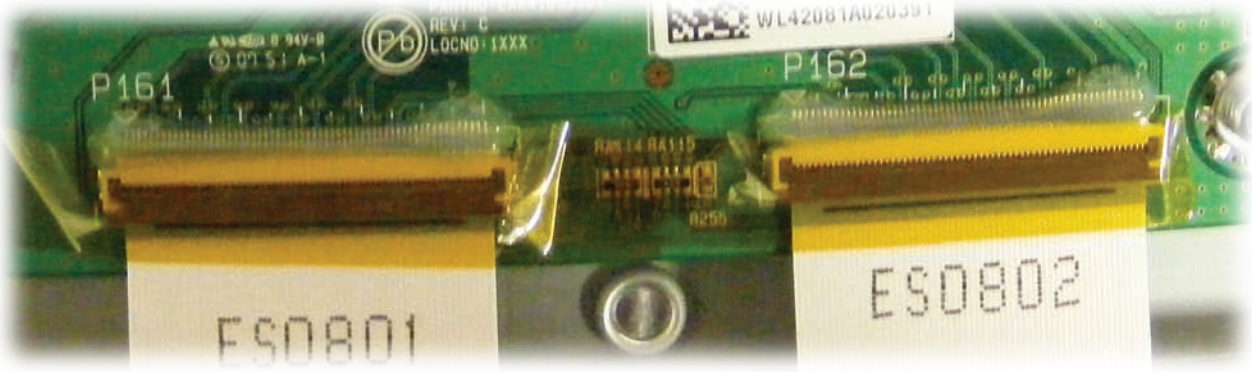


P101 "Y-Sus" to P160 "Control"

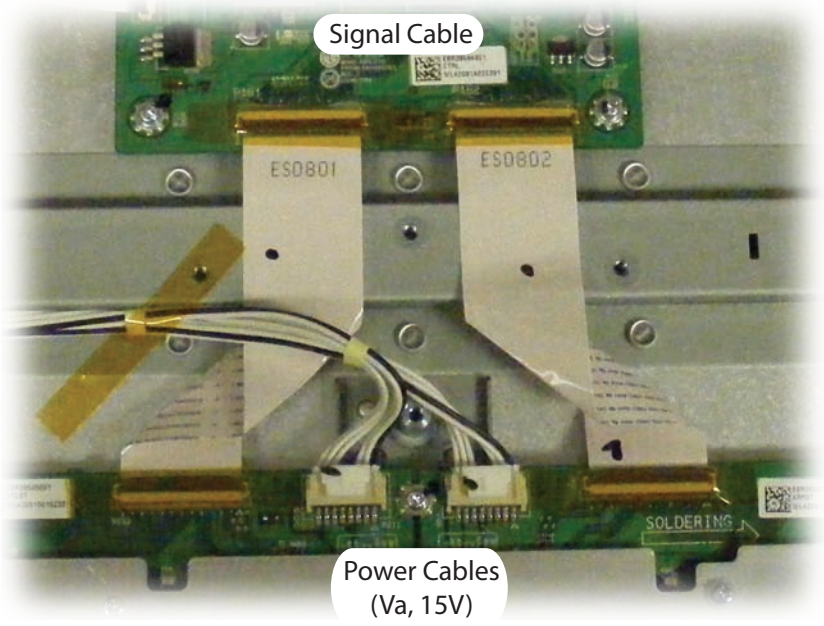
Pin	Label	STBY	Run	Diode Mode	Pin	Label	STBY	Run	Diode Mode	Pin	Label	STBY	Run	Diode Mode
1	Gnd	Gnd	Gnd	Gnd	21	Gnd	Gnd	Gnd	Gnd	41	5V	OV	4.75V	0.76V / (1.7K)
2	CLK	0V	3.2V	2.87V	22	Set_DN2	0V	0.2V	2.87V	42	5V	OV	4.75V	0.76V / (1.7K)
3	Gnd	Gnd	Gnd	Gnd	23	Gnd	Gnd	Gnd	Gnd	43	5V	OV	4.75V	0.76V / (1.7K)
4	STB	0V	0.76V	2.87V	24	PASS_TOP	0V	0.2V	2.87V	44	5V	OV	4.75V	0.76V / (1.7K)
5	Gnd	Gnd	Gnd	Gnd	25	Gnd	Gnd	Gnd	Gnd	45	n/c	n/c	n/c	n/c
6	OSC1	0V	0V	2.87V	26	DELTA_Vy	0V	0.16V	2.87V	46	n/c	n/c	n/c	n/c
7	Gnd	Gnd	Gnd	Gnd	27	Gnd	Gnd	Gnd	Gnd	47	Z-ENABLE	0V	0V	1.25V
8	OSC2	0V	3V	2.87V	28	DET_LEVEL	0V	0V	2.87V	48	Gnd	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd	Gnd	29	Gnd	Gnd	Gnd	Gnd	49	Z-BIAS	0V	1.71V	1.1V
10	DATA	0V	0.6V	2.87V	30	SLOPE_RETE	0V	0V	2.87V	50	Gnd	Gnd	Gnd	Gnd
11	Gnd	Gnd	Gnd	Gnd	31	Gnd	Gnd	Gnd	Gnd	51	VZB-SEL	0V	0V	1.1V
12	SUS_DN	0V	0V	2.87V	32	SET_UP	0V	1.9V	2.87V	52	Gnd	Gnd	Gnd	Gnd
13	Gnd	Gnd	Gnd	Gnd	33	Gnd	Gnd	Gnd	Gnd	53	Z-ER_UP	0V	1.25V	1.1V
14	SUS_UP	0V	2V	2.87V	34	Set_DN_2	0V	1.4V	2.87V	54	Gnd	Gnd	Gnd	Gnd
15	Gnd	Gnd	Gnd	Gnd	35	Gnd	Gnd	Gnd	Gnd	55	Z-ER_DN	0V	1.35V	1.1V
16	ER_DN	0V	1.2V	2.87V	36	X_ER	0V	2.9V	2.87V	56	Gnd	Gnd	Gnd	Gnd
17	Gnd	Gnd	Gnd	Gnd	37	Gnd	Gnd	Gnd	Gnd	57	Z-Sus_UP	0V	0.35V	1.1V
18	ER_UP	0V	2V	2.87V	38	Y-Enable	0V	0.6V	2.87V	58	Gnd	Gnd	Gnd	Gnd
19	Gnd	Gnd	Gnd	Gnd	39	n/c	n/c	n/c	n/c	59	Z-Sus_DN	0V	1.15V	1.1V
20	SET_UP	0V	0.26V	2.87V	40	5V	OV	4.75V	0.76V / (1.7K)	60	Gnd	Gnd	Gnd	Gnd

CONTROL TO X-DRIVE

Connector P161 on the Control board connects to P232 on the left X-Drive. Connector P162 on the Control board connects to P331 on the right X-Drive. These pins are covered in silicon, so no measurement can be made.

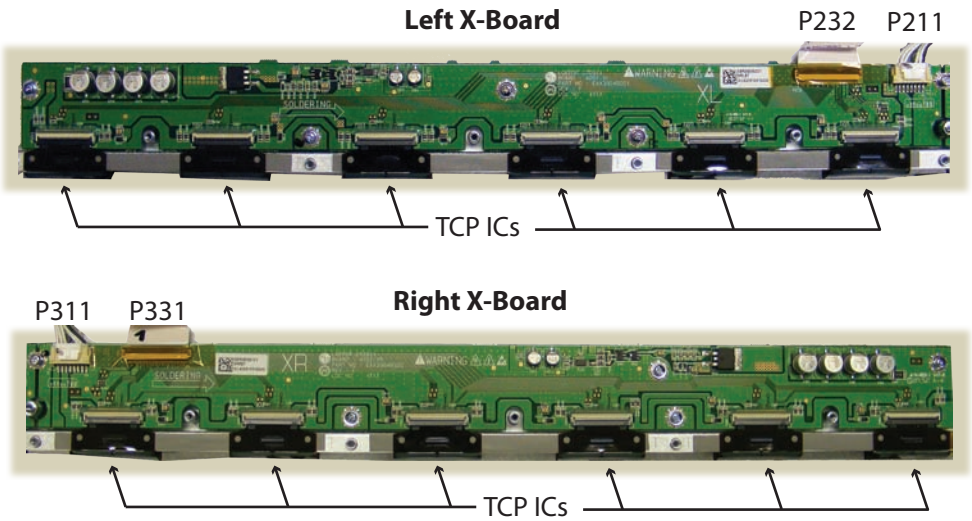


CONTROL TO X-BOARD

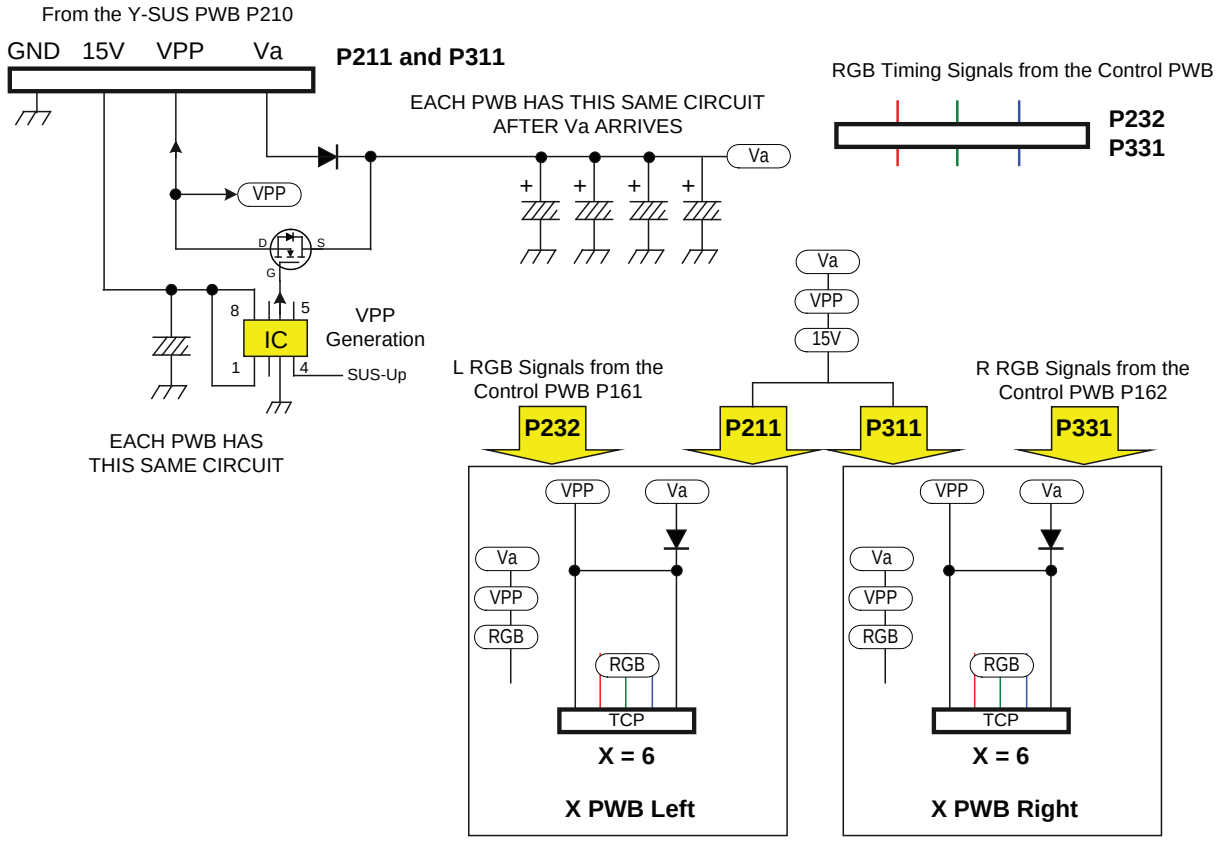


X-DRIVE BOARDS

Warning: DO NOT attempt to run the set with the heat sinks removed from the TCPs. After a very short time, these ICs will begin to self destruct due to overheating. TCP IC's shown are part of the Ribbon Cable.

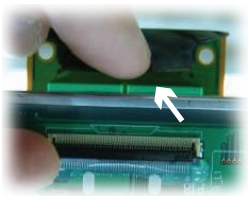


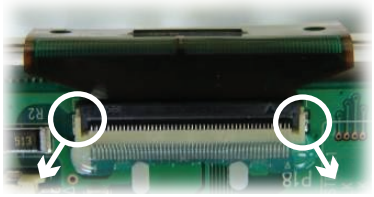
TAPE CARRIER PACKAGE (TCP)



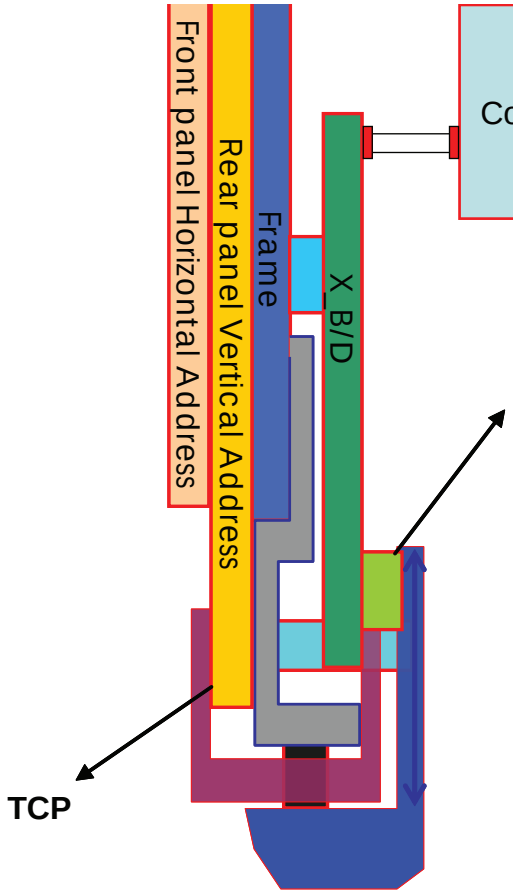
TCP CONNECTOR REMOVAL

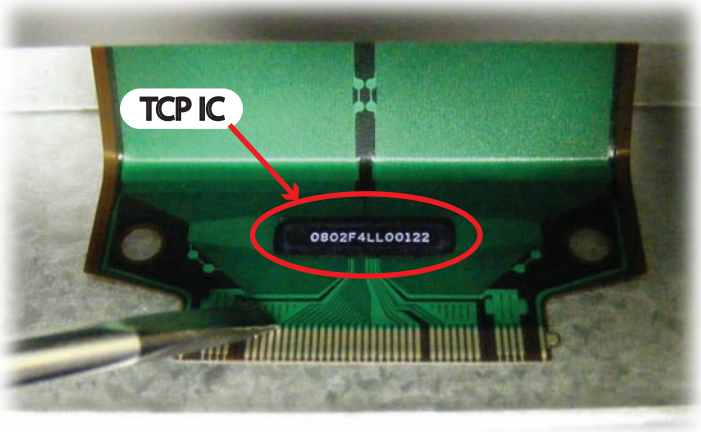
Lift up the lock as shown by arrows. The Lock can be easily broken. It needs to be handled carefully. Pull TCP apart as shown by arrow. TCP Film can be easily damaged., handle with care.





TCP ICs supply RGB 16 bit signal to the PDP by connecting the PAD Electrode of the panel with the X-Board.



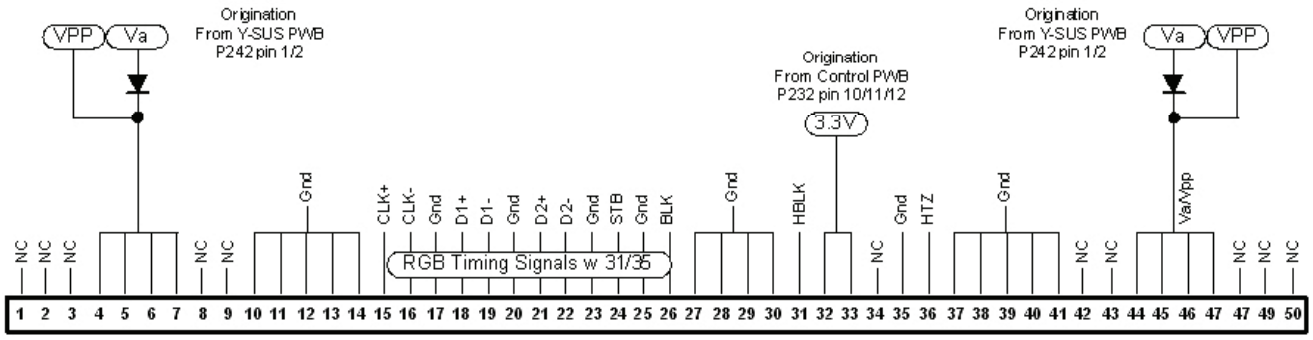


TCP TESTING

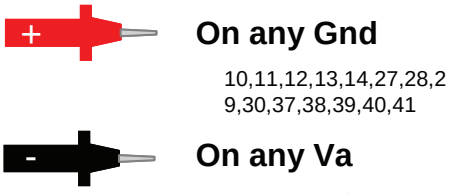
Typical Reading 0.65V Opposite reads open. Look for any TCPs being discolored. Ribbon Damage. Cracks, folds Pinches, scratches, etc.

ANY X BOARD TO TCP

P101~P104 or P201~P206 or P301~P306



Flexible Printed Ribbon Cable to TCP IC

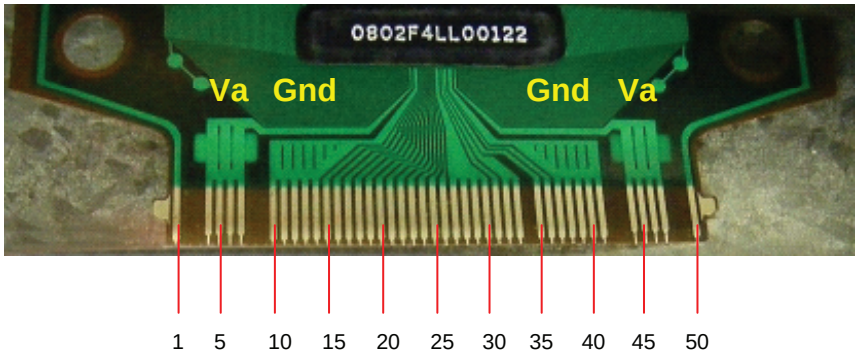


On any Gnd

10,11,12,13,14,27,28,29,30,37,38,39,40,41

On any Va

4,5,6,7,44,45,46,47

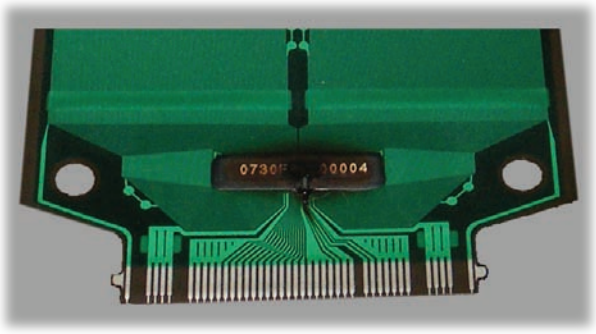


DAMAGED TCP

Warning: DO NOT attempt to run the set with the heat sinks over the TCPs removed. After a very short time, these ICs will begin to self destruct due to overheating.

A damaged TCP can:

1) Cause the Power Supply to shutdown.
2) Generate abnormal vertical bars.
3) Cause the entire area driven by the TCP to be “All White”.
4) Cause the entire area driven by the TCP to be “All Black”.
5) Cause a “Single Line” defect.

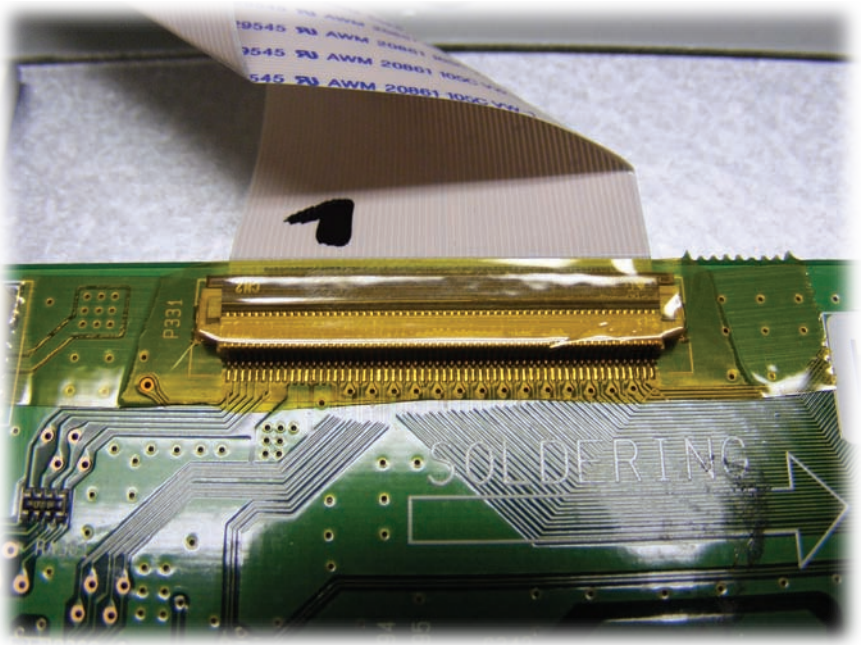


P211 "X-Drive Left" to "Y-Sus" P202				
Pin	Label	Stby	Run	Diode Check
1	Gnd	0V	Gnd	Gnd
2	Gnd	0V	Gnd	Gnd
3	15V	0V	15.4V	Open
4	n/c	0V	n/a	n/a
5	n/c	0V	n/a	n/a
6	VPP	0V	*61.4V	Open
7	VPP	0V	*61.4V	Open
8	VA	0V	*64.9V	Open

P311 "X-Drive Right" to "Y-Sus" P202				
Pin	Label	Stby	Run	Diode Check
1	Gnd	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd	Gnd
3	15V	0V	15V	Open
4	n/c	0V	n/a	n/a
5	n/c	0V	n/a	n/a
6	VPP	0V	*61.4V	Open
7	VPP	0V	*61.4V	Open
8	VA	0V	*64.9V	Open

P232 & P331 CONNECTORS

Voltage and resistance measurements for the X-Drive board. Voltage and resistance measurements for these connectors are difficult to read. They are too close together for safe test. The pins are also protected by a layer of tape to prevent the tab from being released causing separation from the cable and the connector. Take resistance readings with the PCB Disconnected.

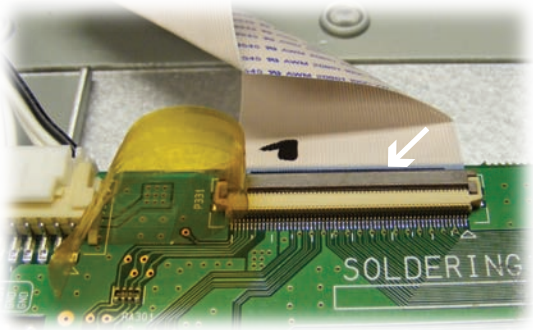


LEFT AND RIGHT X-DRIVE REMOVAL

After the back cover is removed, the Main board is lifted out of the way, the 15 screws are removed from the heat sinks covering the TCPs, the X-Drive boards can be removed. Gently lift the locking mechanism upward on all TCP connectors P201-206 or P301-306.

Peel the tape off the P232 or P331 connectors and gently pry the locking mechanism upward.

Gently pry the locking mechanism upward on all TCP connectors P201-206 or P301-306.

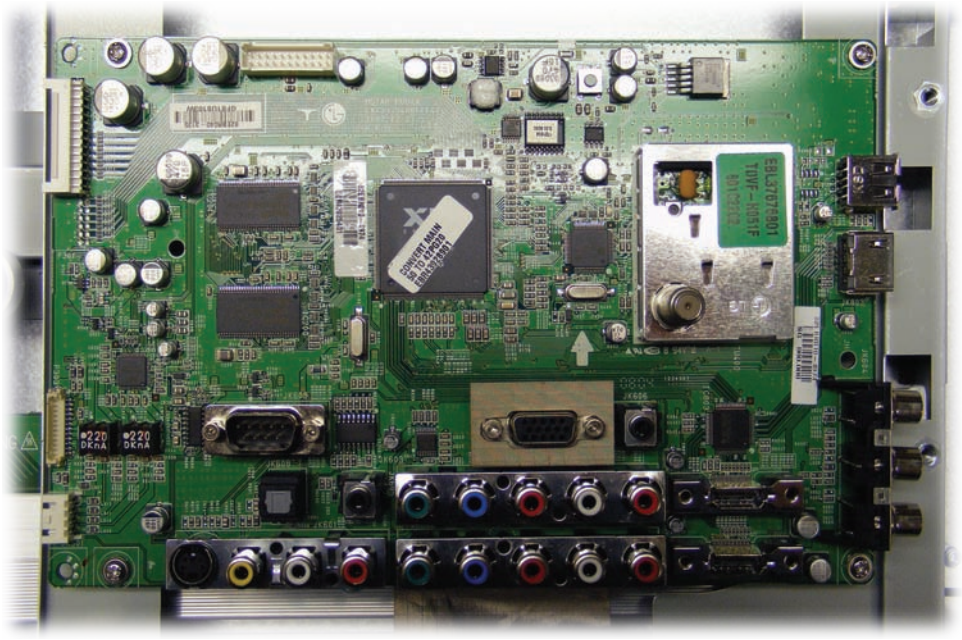


Carefully lift the TCP ribbon up and off the cushion and out of the way.

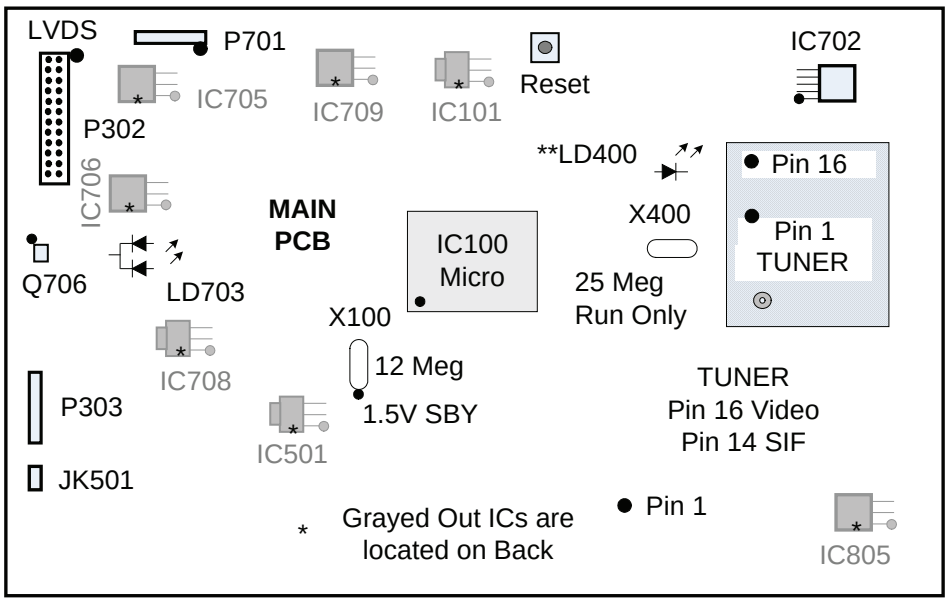
CIRCUIT DESCRIPTIONS

MAIN (DIGITAL) BOARD

42PG20



Main Input Voltages	
Board	Voltage
SMPS	5V
	12V
	16V
Main	5V
	3.3V
	2.5V
	1.8V



IC702
5) .29V
4) 5V
3) 0V
2) 0V
1) 0V

IC705
1) 5V
2) 3.29V
3) 0V

IC706
1) 5V
2) 2.6V
3) 1.37V

IC708
1) 5V
2) 3.31V
3) 0V

IC709
1) 3.29V
2) 1.26V
3) 0V

IC501
1) 3.3V
2) 1.8V
3) 0V

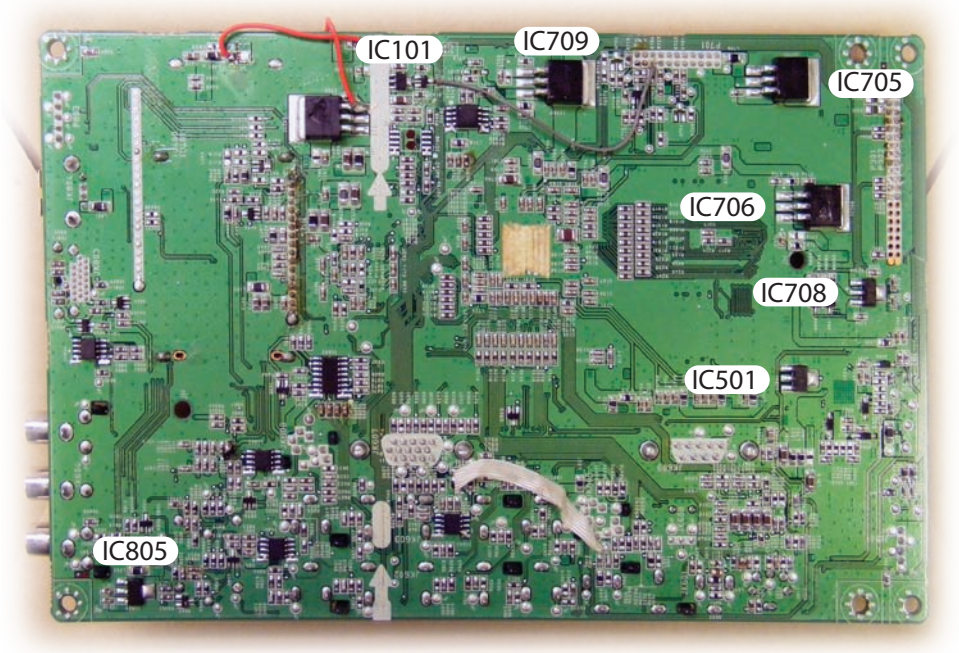
IC805
1) 5V
2) 3.3V
3) 0V

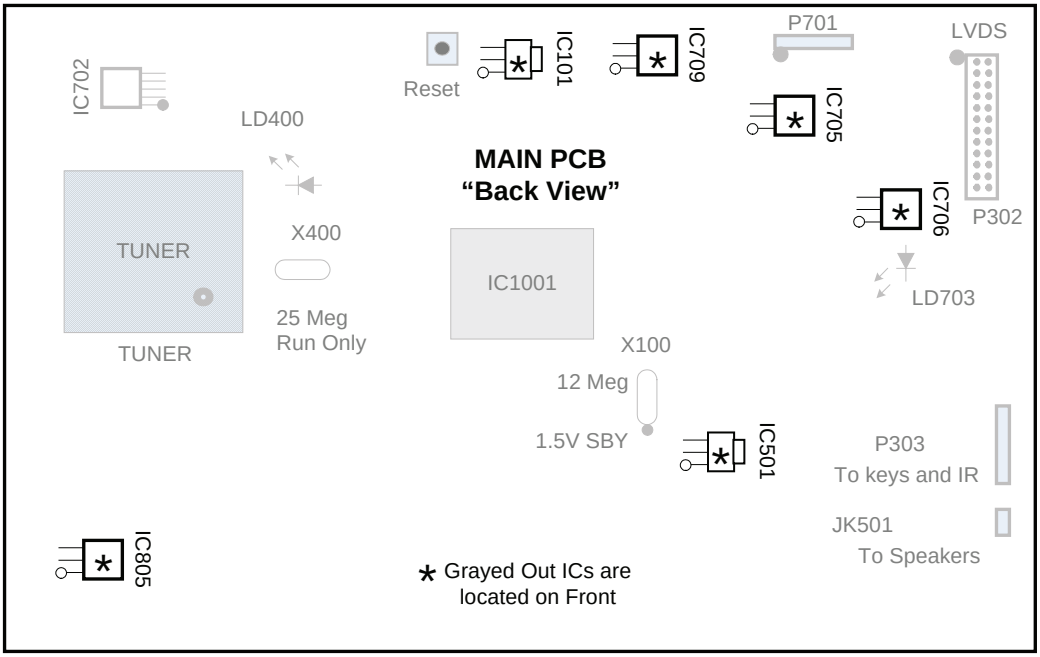
IC101
1) 5V
2) 0V
3) 5V

MAIN BOARD BOTTOM

Be sure to prevent the board from touching the frame while the board is turned over. Use a piece of cardboard or towel to insulate.

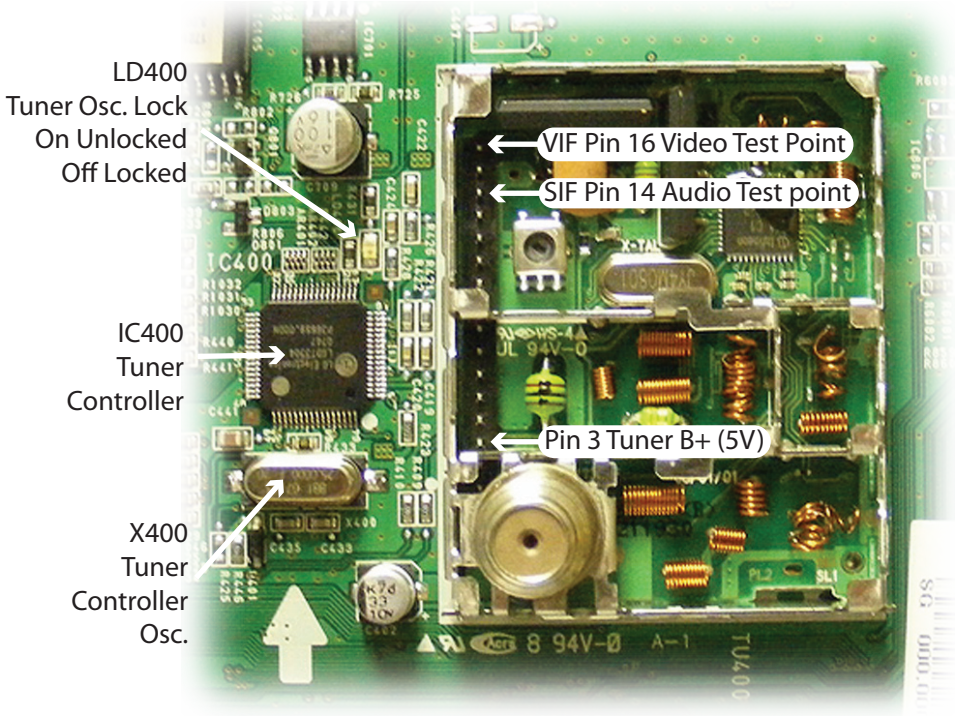
Main ICs		
Chip	Pin	Voltage
IC705	1	5V
	2	3.29V
	3	0V
IC706	1	5V
	2	2.6V
	3	1.37V
IC708	1	5V
	2	3.31V
	3	0V
IC709	1	3.29V
	2	1.26V
	3	0V
IC501	1	3.3V
	2	1.8V
	3	0V
IC805	1	5V
	2	3.3V
	3	0V
IC101	1	5V
	2	0V
	3	5V

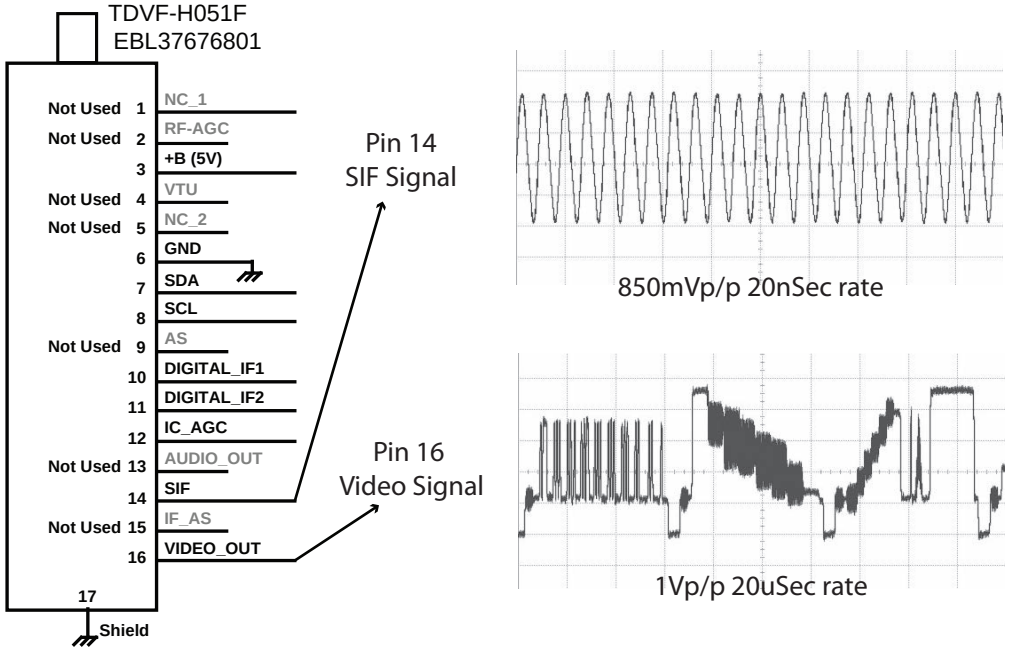




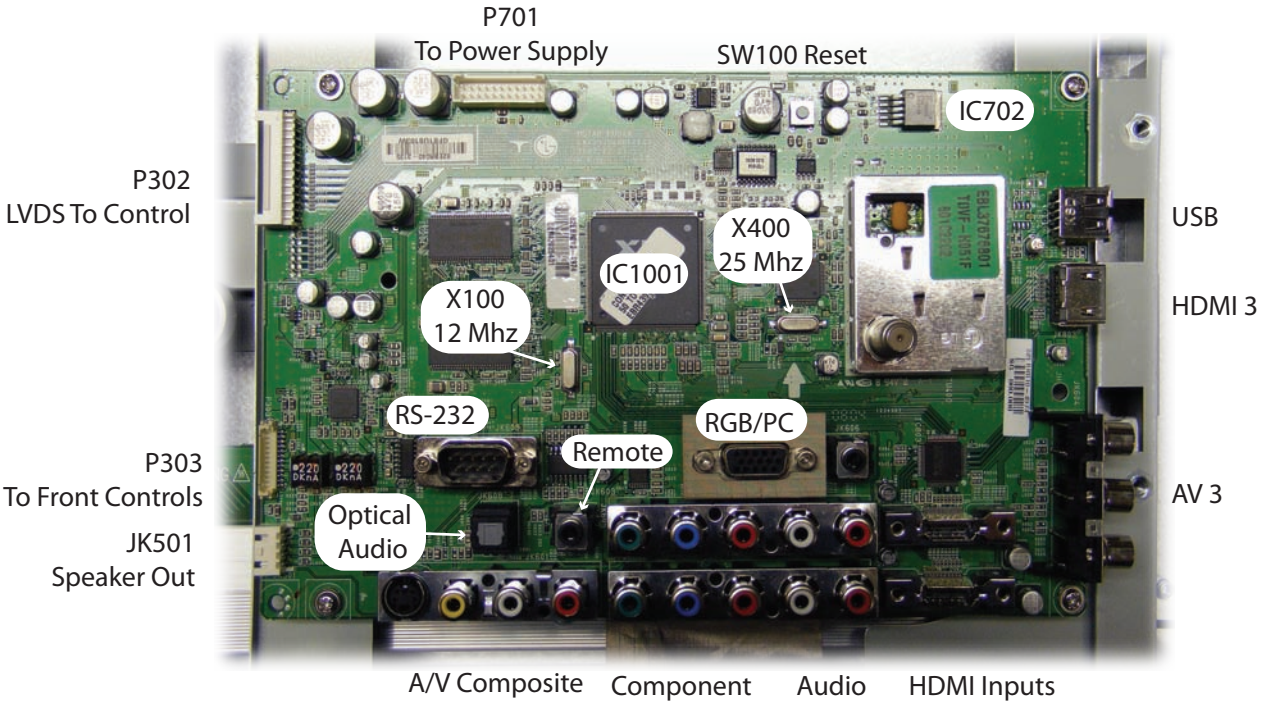
MAIN BOARD TUNER TEST POINTS

Refer to the image below with the shield off and pins exposed on the tuner.





MAIN BOARD CONNECTORS



P302 "Main" P121 "Control"

Pin	Stby	Run	Diode Check	Pin	Stby	Run	Diode Check
1	0V	0V	Open	2	0V	0V	Open
3	0V	0V	Open	4	0V	0V	Open
5	Gnd	Gnd	Gnd	6	Gnd	Gnd	Gnd
7	Gnd	Gnd	Gnd	8	Gnd	Gnd	Gnd
9	0.89V	3.29V	1.97V	10	0.89V	3.29V	1.97V
11	0V	1.25V	1.17V	12	0V	1.21V	1.17V
13	0V	1.25V	1.17V	14	0V	1.21V	1.17V
15	0V	1.27V	1.17V	16	0V	1.21V	1.17V
17	0V	1.22V	1.17V	18	0V	1.25V	1.17V
19	0V	1.24V	1.17V	20	0V	1.21V	1.17V
21	0V	1.24V	0.83V	22	0V	1.18V	1.17V
23	0V	0.58V	1.01V	24	0.93V	3.29V	1.5V
25	0V	3.29V	Open	26	Gnd	Gnd	Gnd

P701 "Main" to P813 "SMPS"

Pin	Label	STBY	Run	Diode Check	Pin	Label	STBY	Run	Diode Check
1	15V	0V	16.5V	3.8V	2	15V	0V	16.5V	2.82V
3	Gnd	Gnd	Gnd	Gnd	4	Gnd	Gnd	Gnd	Gnd
5	NC	NC	NC	Open	6	NC	NC	NC	Open
7	Gnd	Gnd	Gnd	Gnd	8	Gnd	Gnd	Gnd	Gnd
9	5V	5V	5V	0.75V	10	5V	5V	5V	0.75V
11	5V	5V	5V	0.75V	12	5V	5V	5V	0.75V
13	Gnd	Gnd	Gnd	Gnd	14	Gnd	Gnd	Gnd	Gnd
15	Gnd	Gnd	Gnd	Gnd	16	Gnd	Gnd	Gnd	Gnd
17	5_V Det	.15V	5V	3.25V	18	AC Det	5V	5V	Open
19	RL_On	0V	3.73V	Open	20	Vs_On	0V	3.2V	1.22V
21	M5V_	3.27V	3.24V	1.22V	22	AUTO	Gnd	Gnd	Gnd

CN701 "Main" to "Speakers"

Pin	Stby	Run	Diode Check
1	0V	8V	2.58V
2	0V	8V	2.58V
3	0V	8V	2.58V
4	0V	8V	2.58V

P303 "MAIN" to "Front Keys"

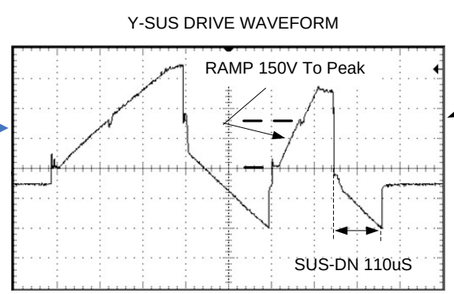
Pin	STBY	Run	Diode Check
1	5V	5V	2.99V
2	Gnd	Gnd	Gnd
3	0V	3.29V	1.18V
4	Gnd	Gnd	Gnd
5	0V	3.29V	1.18V
6	Gnd	Gnd	Gnd
7	5V	5V	0.75V
8	Gnd	Gnd	Gnd
9	0V	0V	1.12V
10	Gnd	Gnd	Gnd
11	0V	3.84V	1.03V
12	Gnd	Gnd	Gnd

Resistance Readings with the board Disconnected. DVM in the Diode mode.

Spring 2008 PDP Training

42PG20 CIRCUIT INTERCONNECT DIAGRAM

Y-SUS DRIVE WAVEFORM



4mS

Ch1	100V	100us	540Vp/p

62V~57V (AC) rms (Dark to White)

Y-SUS TP

P1
P2
Waveform
TP
P3
P100
P4
P204
Y-SUS Drive
P5
P6
P211
P200
5V Fuse
P7
FL1
C18
P8

-VY TP
R210

VSC TP
R211

Y-SUSTAIN

VR601
Set-dn

VR602
Ramp

VSC
VR501

-VY
VR502

VZB
VR905

VZB TP
R946

FS202
(VS)
125V 4A
Glass

No IPMs
No IPMs
No IPMs
No IPMs

P201
P801
Fusable Link
FS201 (5V)
125V 1.5A
P101

FS701 (VA)
125V 10A
P202
Fusable Link

P201

Pin	Label	STBY	Run
1	Vs	0V	*194V
2	Vs	0V	*194V
3	nc	nc	nc
4	Gnd	0V	0V
5	Gnd	0V	0V
6	Va	0V	*65V
7	Va	0V	*65V
8	Gnd	0V	0V
9	M5V	0V	5V
10	M5V	0V	5V

*Variable according to Label

P812

Pin	STBY	Run
1	0V	*195V
2	0V	*195V
3	0V	0V
4	n/c	n/c
5	0V	0V
6	0V	*65V
7	0V	*65V
8	0V	0V
9	0V	5V
10	0V	5V

P813

Pin	STBY	Run	No Load
1, 2	0V	16.5V	16.5V
3, 4	Gnd	Gnd	Gnd
5, 6	NC	NC	NC
7, 8	Gnd	Gnd	Gnd
9, 10	5V	5V	5V
11, 12	5V	5V	5V
13, 14	Gnd	Gnd	Gnd
15, 16	Gnd	Gnd	Gnd
17	.15V	5V	5V
18	5V	5V	5V
19	0V	3.73V	0V
20	0V	3.2V	0V
21	0V	3.24V	0V
22	0V	0V	5V

P812

VS Adj
R951

VA Adj
R901

SMPS PCB POWER SUPPLY

P813

A/C IN
CN101

SMPS Test – Unplug P813 If all supplies do not run when A/C is reapplied, disconnect P812 to isolate the excessive load. This supply will operate with no external load.

To Check 5V to the Y Drive, measure across capacitor C18.
The voltage is supplied thru FL1.

P202

Pin	Label	STBY	Run
1	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd
3	15V	0V	15.8V
4	ER2	0V	61.5V
5	ER2	0V	61.5V
6	Va	0V	64.9V
7	Gnd	Gnd	Gnd
8	Gnd	Gnd	Gnd
9	15V	0V	15.8V
10	ER1	0V	61.5V
11	ER1	0V	61.5V
12	Va	0V	*64.9V

*Varible according to Label

No Connection

P164 P131
IC121
ROM Updates

P121
X101
50 Meg

TEMP LEDS
D15 D16 D17

Pin 1 (5V)
Pin 2 (3.3V)
Pin 3 (0V)

With the unit on. If none of D15, 16, 17 are illuminated. Check supplies to the PCB. If they are present replace the Control PCB

CONTROL PCB

FL111 FL112
5V Fuses

P160
IC122
P161
P162

Auto Gen

Pin 1 (5V)
Pin 2 (3.3V)
Pin 3 (0V)

Unplug all connectors. Jump 5V from SMPS (P813 pins 9~12) to pin 1 of IC121. Observe Temp LEDs. If they light, most likely Control PWB is OK. 1st check FL111 and FL112.

Disconnect P201 from the Y SUS Board and connect a Jumper from Pin 10 of P812 (M5V) to Pin 10 P201 (5V). The 5V will be routed to the Control Board via FS201, Ribbon Cable P101 on the Y SUS Board and FL111 and FL112 on the Control Board for Control Board operation verification.

Short across the two points labeled Auto Gen to generate a test pattern.

* If the complaint is no video and shorting the points (AutoGen) causes video to appear suspect the Digital PCB.

Va and 16V

P232 P211 P311 P331

LEFT X DRIVE

P201 P202 P203 P204 P205 P206

RIGHT X DRIVE

P301 P302 P303 P304 P305 P306

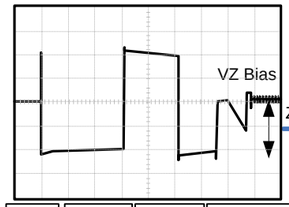
Remove all input signals from the unit so the menu will be the only video to be found on the LVDS cable.
NOTE: White noise from the tuner may cause these signals to vary. These were taken with the unit set to component with no input signal.

See next page for waveforms

P302

Pin	State	Ref#
11	Menu Off	10
	Menu On	11
12	Menu Off	08
	Menu On	09
13	Menu Off	12
	Menu On	13
14	Menu Off	06
	Menu On	07
15	Menu Off	14
	Menu On	15
16	Menu Off	04
	Menu On	05
19	Menu Off	16
	Menu On	17
20	Menu Off	02
	Menu On	03
21	Menu Off	18
	Menu On	19
22	Menu Off	00
	Menu On	01

Z-SUS



Ch1	50.0V	100us	220Vp/p

52V (AC) rms

P2
Z-SUSTAIN
Z-SUS TP
R1 Bottom Leg
P1
P3

DIGITAL PCB: Remove all input signals from the unit so the menu will be the only video to be found on the LVDS cable.
NOTE: White noise from the tuner may cause these signals to vary. These were taken with the unit set to component with no input signal.

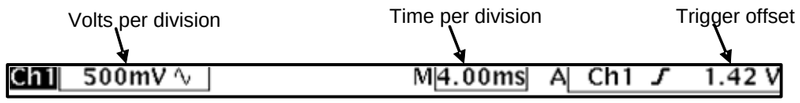
**LD400 lit during initialization. Tuner lock OK turns LED off.

LVDS
P701
IC705
IC709
IC101
Reset
IC702
P302
IC706
**LD400
Pin 16
Pin 1
TUNER
X400
25 Meg
Run Only
MAIN PCB
IC100
Micro
Q706
LD703
X100
12 Meg
1.5V SBY
IC708
IC501
P303
JK501
TUNER
Pin 16 Video
Pin 14 SIF
* Grayed Out ICs are located on Back
Pin 1
IC805

To keys and IR
To Speakers

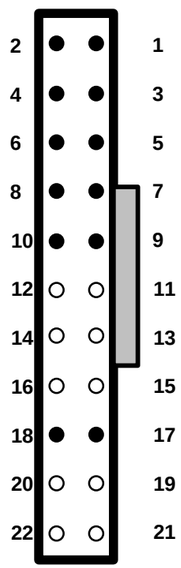
LD703 Lights Red in Stby. 5VSBY from SMPS OK. Set on, Lights Red 5V General OK. Appears Amber

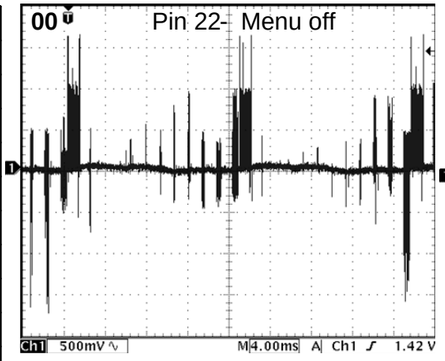
IC702	IC709
5) .29V	1) 3.29V
4) 5V	2) 1.26V
3) 0V	3) 0V
2) 0V	
1) 0V	IC501
	1) 3.3V
IC705	2) 1.8V
1) 5V	3) 0V
2) 3.29V	
3) 0V	
	IC805
IC706	1) 5V
1) 5V	2) 3.3V
2) 2.6V	3) 0V
3) 1.37V	
IC708	IC101
1) 5V	1) 5V
2) 3.31V	2) 0V
3) 0V	3) 5V

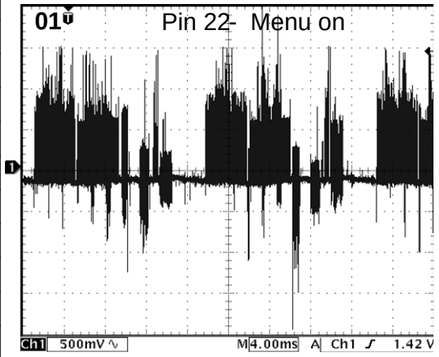


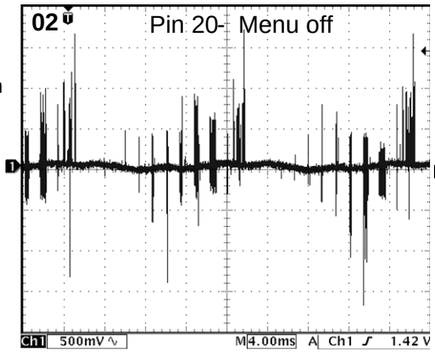
P302		
Pin	**State**	**Ref #**
11	Menu Off	10
	Menu On	11
12	Menu Off	08
	Menu On	09
13	Menu Off	12
	Menu On	13
14	Menu Off	06
	Menu On	07
15	Menu Off	14
	Menu On	15
16	Menu Off	04
	Menu On	05
19	Menu Off	16
	Menu On	17
20	Menu Off	02
	Menu On	03
21	Menu Off	18
	Menu On	19
22	Menu Off	00
	Menu On	01

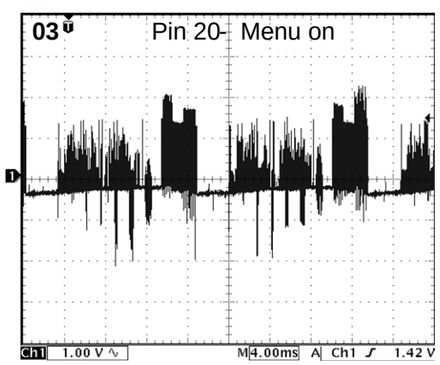
Connector P302 Configuration
○ - indicates signal pins.

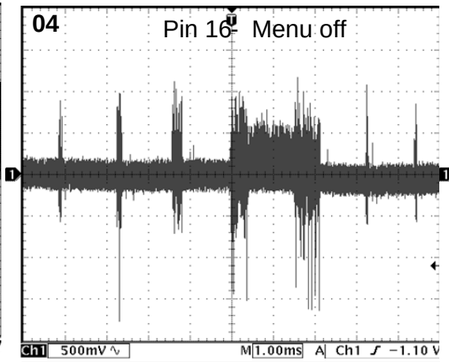


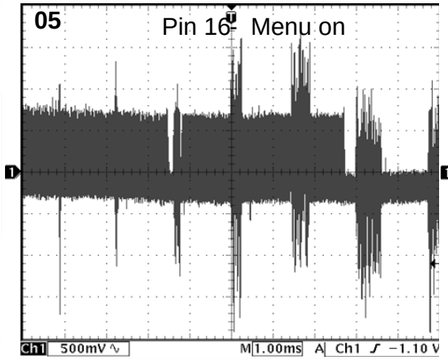


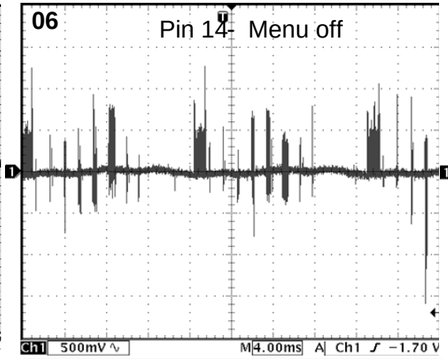


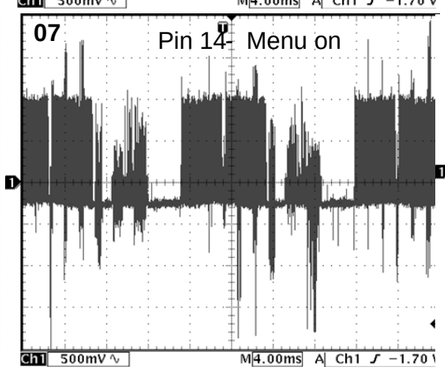


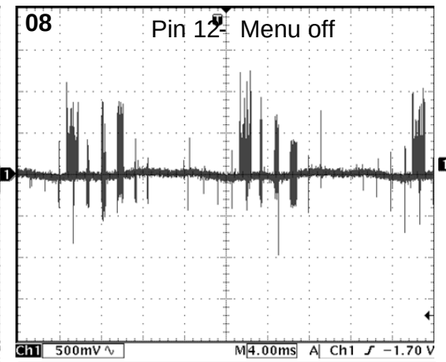


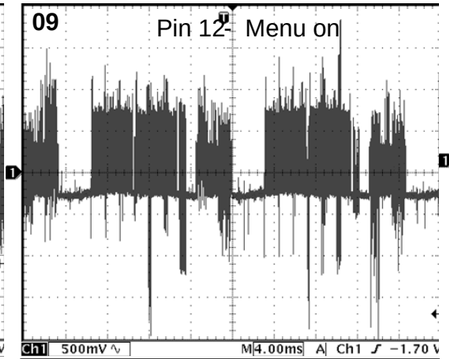


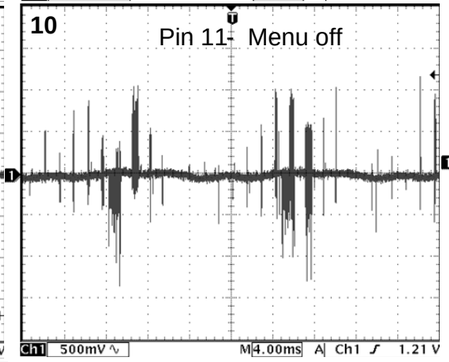


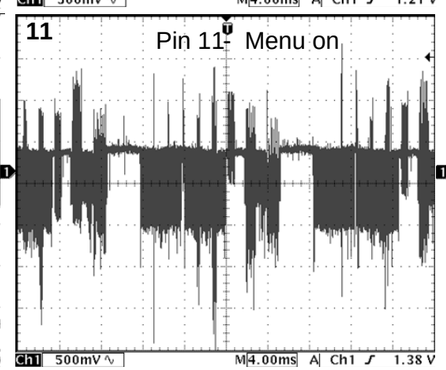


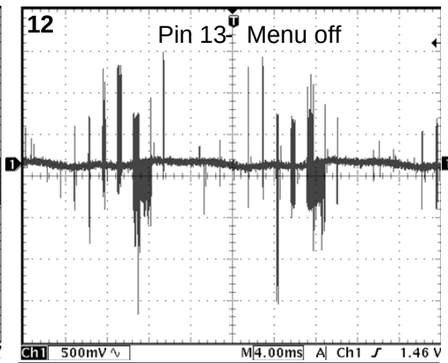


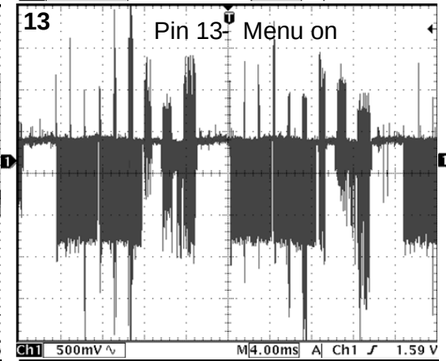


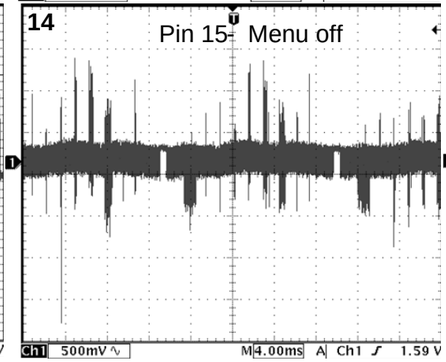


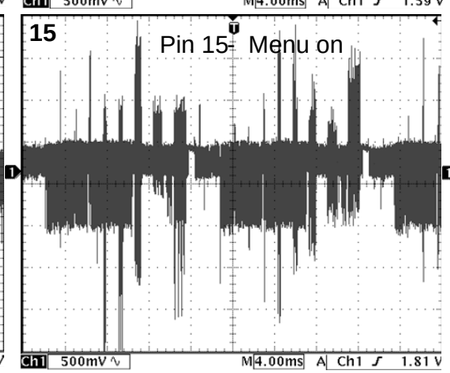


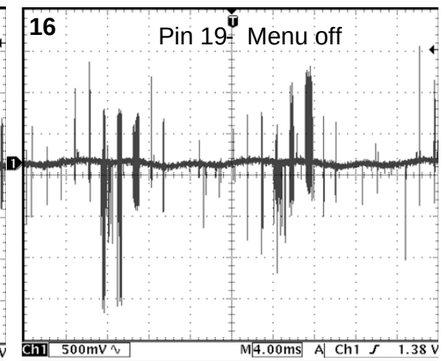


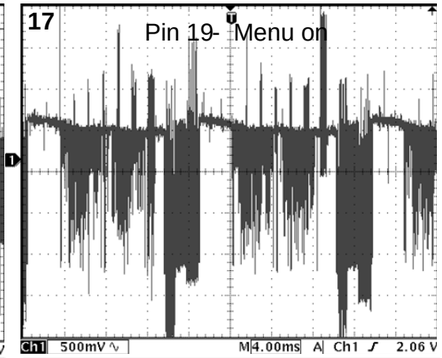


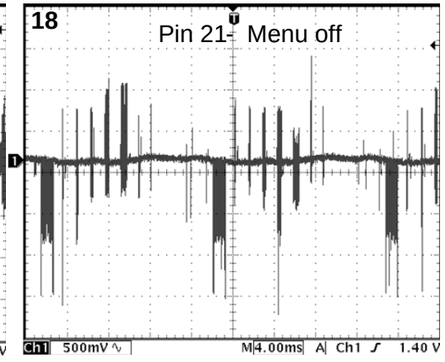


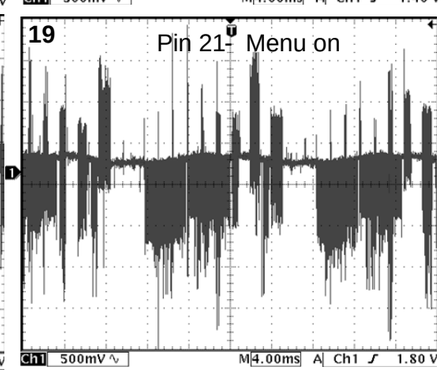


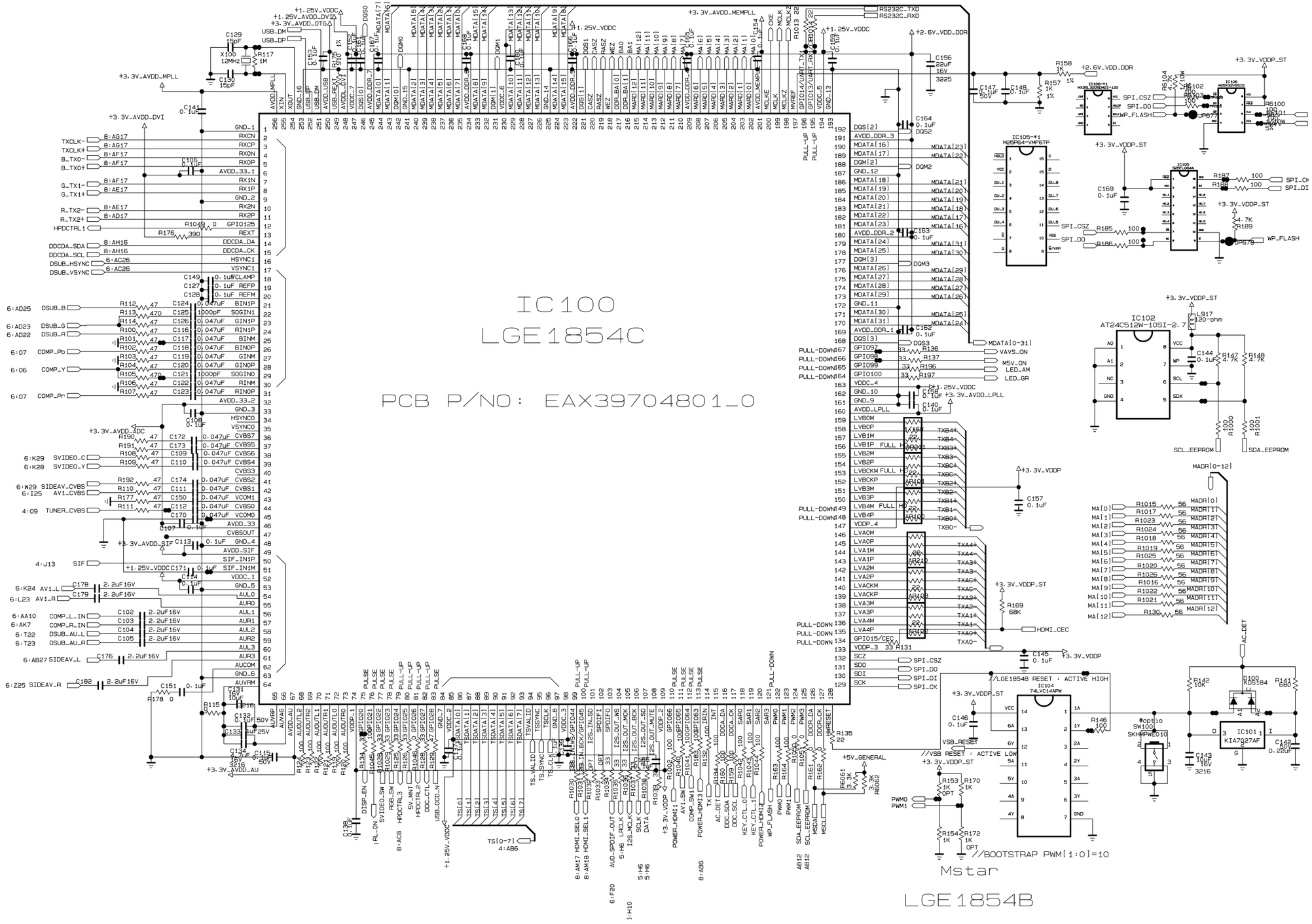




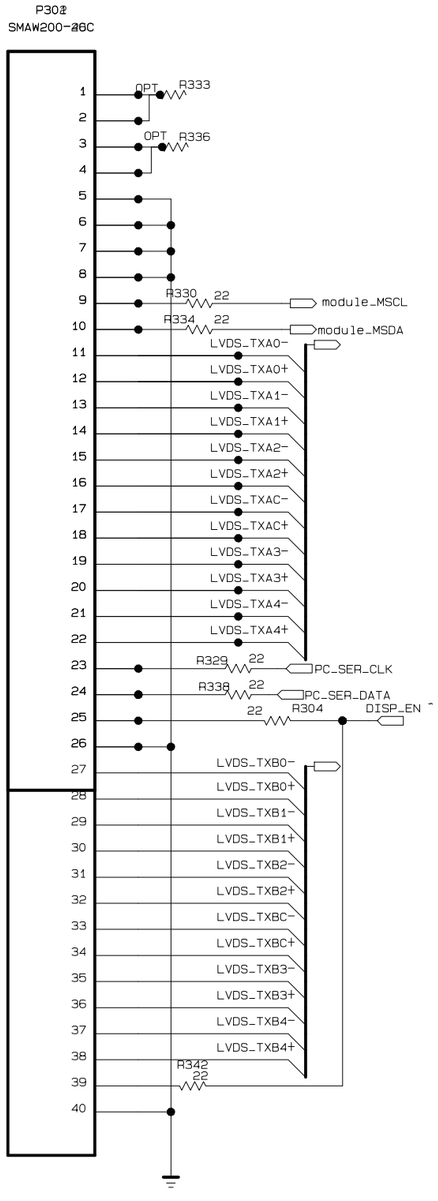


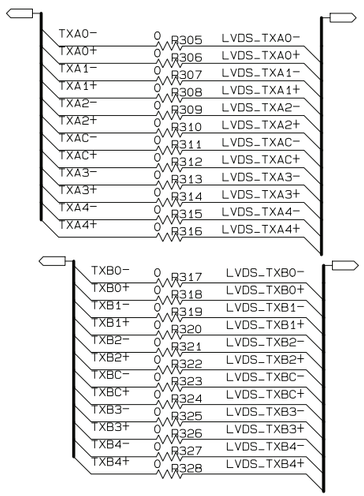


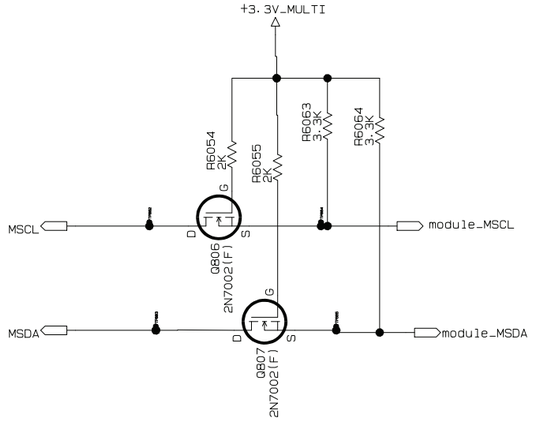



IC100
LGE1854C
PCB P/NO: EAX39704801_0
Mstar
LGE1854B
IC102
AT24C512W-10SI-2.7
IC104
74LVC14APW
IC105-#1
MCSP64-WFBTP
IC105-#2
SDFL064A
IC106-#1
M24128-BWDW6G
IC106-#2
M24128-BWDW6G
IC101
KIA7027AF
SW100
SKHHPWE010
SCL_EEPROM
SDA_EEPROM
WP_FLASH
SPI_CSZ
SPI_DO
SPI_DI
SPI_CK
HDMI_CEC
AC_DET
VAVS_ON
M5V_ON
LED_AM
LED_GR
MDATA[0-31]
MADR[0-12]
TS[0-7]
TXA0-
TXA1-
TXA2-
TXA3-
TXA4-
TXB0-
TXB1-
TXB2-
TXB3-
TXB4-
TXBC-
TXBC+
//LGE1854B RESET : ACTIVE HIGH
//VSB RESET : ACTIVE LOW
//BOOTSTRAP PWM[1:0]=10

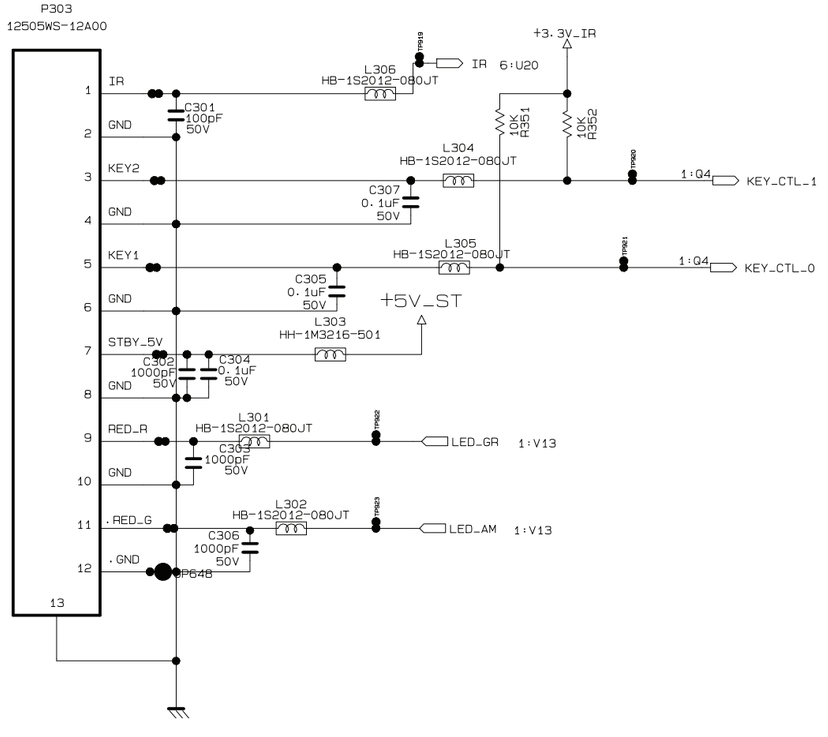
LVDS

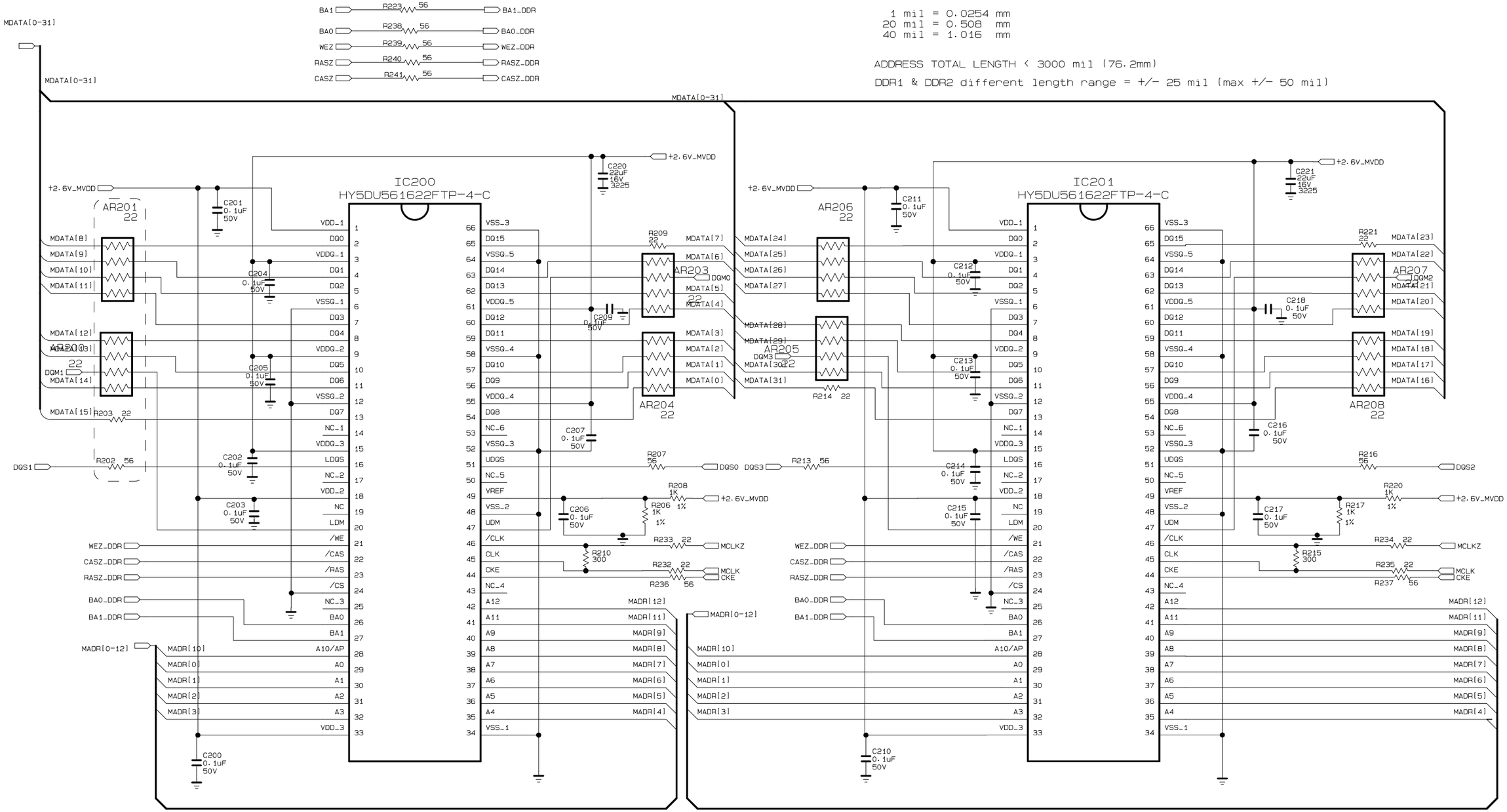

P302
SMAW200-26C
OPT R333
OPT R336
R330 22 module_MSCL
R334 22 module_MSDA
LVDS_TXA0-
LVDS_TXA0+
LVDS_TXA1-
LVDS_TXA1+
LVDS_TXA2-
LVDS_TXA2+
LVDS_TXAC-
LVDS_TXAC+
LVDS_TXA3-
LVDS_TXA3+
LVDS_TXA4-
LVDS_TXA4+
R329 22 PC_SER_CLK
R338 22 PC_SER_DATA
22 R304 DISP_EN
LVDS_TXB0-
LVDS_TXB0+
LVDS_TXB1-
LVDS_TXB1+
LVDS_TXB2-
LVDS_TXB2+
LVDS_TXBC-
LVDS_TXBC+
LVDS_TXB3-
LVDS_TXB3+
LVDS_TXB4-
LVDS_TXB4+
R342 22


TXA0- 0 R305 LVDS_TXA0-
TXA0+ 0 R306 LVDS_TXA0+
TXA1- 0 R307 LVDS_TXA1-
TXA1+ 0 R308 LVDS_TXA1+
TXA2- 0 R309 LVDS_TXA2-
TXA2+ 0 R310 LVDS_TXA2+
TXAC- 0 R311 LVDS_TXAC-
TXAC+ 0 R312 LVDS_TXAC+
TXA3- 0 R313 LVDS_TXA3-
TXA3+ 0 R314 LVDS_TXA3+
TXA4- 0 R315 LVDS_TXA4-
TXA4+ 0 R316 LVDS_TXA4+
TXB0- 0 R317 LVDS_TXB0-
TXB0+ 0 R318 LVDS_TXB0+
TXB1- 0 R319 LVDS_TXB1-
TXB1+ 0 R320 LVDS_TXB1+
TXB2- 0 R321 LVDS_TXB2-
TXB2+ 0 R322 LVDS_TXB2+
TXBC- 0 R323 LVDS_TXBC-
TXBC+ 0 R324 LVDS_TXBC+
TXB3- 0 R325 LVDS_TXB3-
TXB3+ 0 R326 LVDS_TXB3+
TXB4- 0 R327 LVDS_TXB4-
TXB4+ 0 R328 LVDS_TXB4+


+3.3V_MULTI
R6054 2K
R6055 2K
R6063 3.3K
R6064 3.3K
MSCL
MSDA
module_MSCL
module_MSDA
Q805 2N7002(F)
Q807 2N7002(F)

Key Pad


P303
12505WS-12A00
IR
GND
KEY2
KEY1
STBY_5V
RED_R
RED_G
GND
L306 HB-1S2012-080JT
IR 6:U20
+3.3V_IR
10K R351
10K R352
L304 HB-1S2012-080JT
1:Q4 KEY_CTL_1
C307 0.1uF 50V
L305 HB-1S2012-080JT
1:Q4 KEY_CTL_0
C305 0.1uF 50V
+5V_ST
L303 HH-1M3216-501
C302 1000pF 50V
C304 0.1uF 50V
L301 HB-1S2012-080JT
LED_GR 1:V13
C303 1000pF 50V
L302 HB-1S2012-080JT
LED_AM 1:V13
C306 1000pF 50V
C301 100pF 50V
L307 HB-1S2012-080JT
L308 HB-1S2012-080JT


BA1 R223 56 BA1_DDR
BA0 R238 56 BA0_DDR
WEZ R239 56 WEZ_DDR
RASZ R240 56 RASZ_DDR
CASZ R241 56 CASZ_DDR
1 mil = 0.0254 mm
20 mil = 0.508 mm
40 mil = 1.016 mm
ADDRESS TOTAL LENGTH < 3000 mil (76.2mm)
DDR1 & DDR2 different length range = +/- 25 mil (max +/- 50 mil)
MDATA[0-31]
IC200
HY5DU561622FTP-4-C
IC201
HY5DU561622FTP-4-C
+2.6V_MVDD
AR201 22
AR202 22
AR203 22
AR204 22
AR205 22
AR206 22
AR207 22
AR208 22
R202 56
R203 22
R206 1K 1%
R208 1K 1%
R210 300
R213 56
R214 22
R215 300
R216 56
R217 1K 1%
R220 1K 1%
R221 22
R232 22
R233 22
R234 22
R235 22
R236 56
R237 56
C200 0.1uF 50V
C201 0.1uF 50V
C202 0.1uF 50V
C203 0.1uF 50V
C204 0.1uF 50V
C205 0.1uF 50V
C206 0.1uF 50V
C207 0.1uF 50V
C209 0.1uF 50V
C210 0.1uF 50V
C211 0.1uF 50V
C212 0.1uF 50V
C213 0.1uF 50V
C214 0.1uF 50V
C215 0.1uF 50V
C216 0.1uF 50V
C217 0.1uF 50V
C218 0.1uF 50V
C220 22uF 16V 3225
C221 22uF 16V 3225
DQS1
DQS0
DQS3
DQS2
DQM1
DQM0
DQM3
DQM2
MCLKZ
MCLK
CKE
WEZ_DDR
CASZ_DDR
RASZ_DDR
BA0_DDR
BA1_DDR
MADR[0-12]
MADR[10]
MADR[0]
MADR[1]
MADR[2]
MADR[3]
MADR[4]
MADR[5]
MADR[6]
MADR[7]
MADR[8]
MADR[9]
MADR[11]
MADR[12]
MDATA[0]
MDATA[1]
MDATA[2]
MDATA[3]
MDATA[4]
MDATA[5]
MDATA[6]
MDATA[7]
MDATA[8]
MDATA[9]
MDATA[10]
MDATA[11]
MDATA[12]
MDATA[13]
MDATA[14]
MDATA[15]
MDATA[16]
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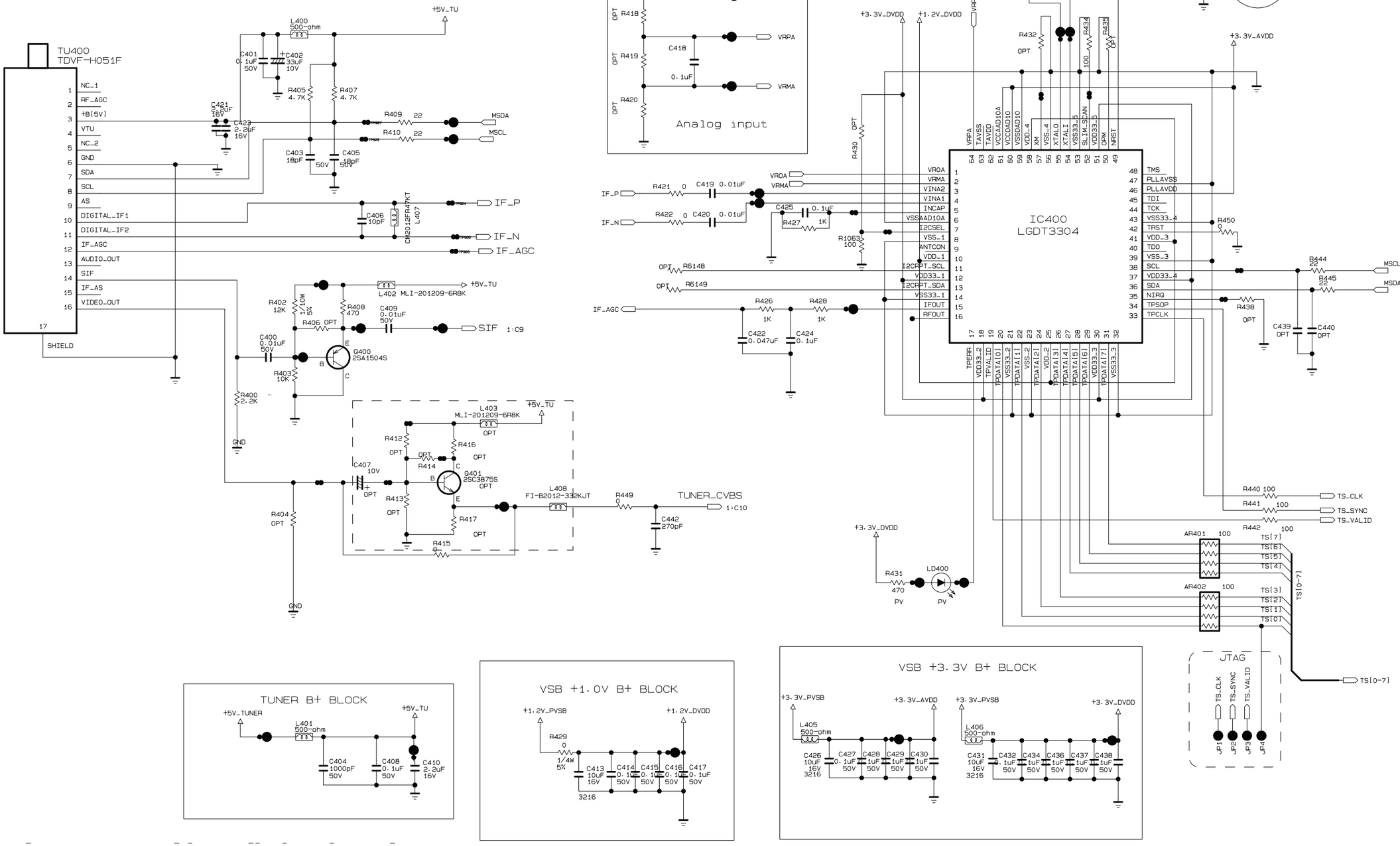
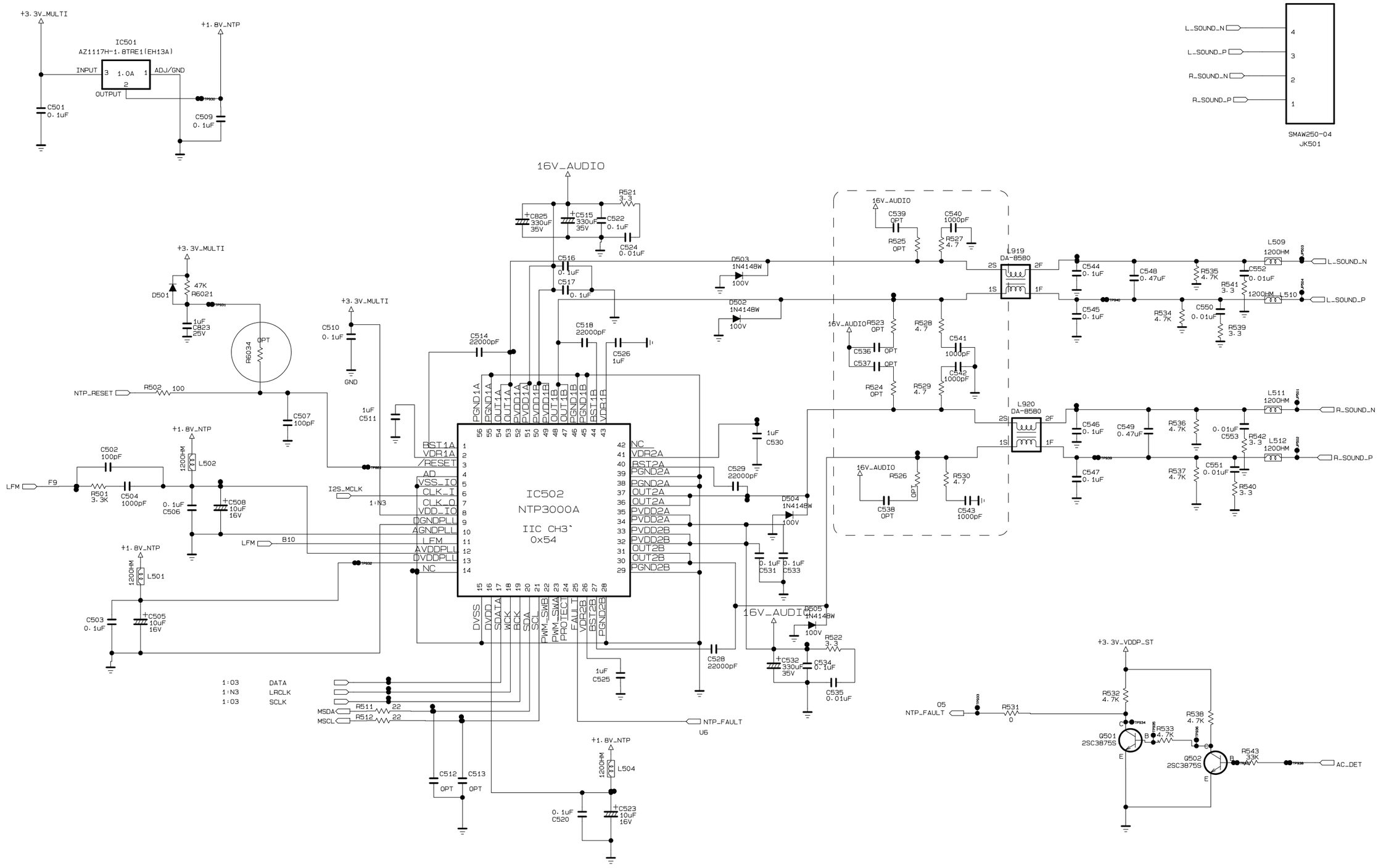
MDATA[22]
MDATA[23]
MDATA[24]
MDATA[25]
MDATA[26]
MDATA[27]
MDATA[28]
MDATA[29]
MDATA[30]
MDATA[31]
VDD_1
DQ0
VDDQ_1
DQ1
DQ2
VSSQ_1
DQ3
DQ4
VDDQ_2
DQ5
DQ6
VSSQ_2
DQ7
NC_1
VDDQ_3
LDQS
NC_2
VDD_2
NC
LDM
/WE
/CAS
/RAS
/CS
NC_3
BA0
BA1
A10/AP
A0
A1
A2
A3
VDD_3
VSS_3
DQ15
VSSQ_5
DQ14
DQ13
VDDQ_5
DQ12
DQ11
VSSQ_4
DQ10
DQ9
VDDQ_4
DQ8
NC_6
VSSQ_3
UDQS
NC_5
VREF
VSS_2
UDM
/CLK
CLK
CKE
NC_4
A12
A11
A9
A8
A7
A6
A5
A4
VSS_1


TU400
TDVF-H051F
NC_1
RF_AGC
+B[5V]
VTU
NC_2
GND
SDA
SCL
AS
DIGITAL_IF1
DIGITAL_IF2
IF_AGC
AUDIO_OUT
SIF
IF_AS
VIDEO_OUT
SHIELD
+5V_TU
L400 500-ohm
C401 0.1uF 50V
C402 33uF 10V
C421 2.2uF 16V
C423 2.2uF 16V
R405 4.7K
R407 4.7K
R409 22
R410 22
MSDA
MSCL
C403 18pF 50V
C405 18pF 50V
C406 10pF
CM2012F47NKT L407
IF_P
IF_N
IF_AGC
L402 MLI-201209-6R8K
R402 12K
R408 470
R406 OPT
C409 0.01uF 50V
SIF 1:C9
C400 0.01uF 50V
Q400 2SA1504S
R403 10K
R400 2.2K
GND
L403 MLI-201209-6R8K
R412 OPT
R416 OPT
R414 OPT
C407 10V OPT
Q401 2SC3875S OPT
R413 OPT
R417 OPT
R415 0
L408 FI-B2012-332KJT
R449 0
TUNER_CVBS 1:C10
C442 270pF
R404 OPT
GND
+3.3V_AVDD
R423 5.1K
R418 OPT
R419 OPT
R420 OPT
C418 0.1uF
VR0A
VRPA
VRMA
Analog input
27pF C433
X400 25MHz
27pF C435
R433 1M
+3.3V_AVDD
1N4148W D401
R446 47K
R425 OPT
VSB_RESET
C441 1uF 25V
+3.3V_DVDD
+1.2V_DVDD
VRPA
R432 OPT
R434 100
R435 OPT
R430 OPT
IF_P
IF_N
IF_AGC
R421 0
C419 0.01uF
R422 0
C420 0.01uF
C425 0.1uF
R427 1K
R1063 100
R6148 OPT
R6149 OPT
R426 1K
R428 1K
C422 0.047uF
C424 0.1uF
IC400
LGDT3304
VR0A
VRMA
VINA2
VINA1
INCAP
VSSAAD10A
I2CSEL
VSS_1
ANTCON
VDD_1
I2CRPT_SCL
VDD33_1
I2CRPT_SDA
VSS33_1
IFOUT
RFOUT
VRPA
TAVSS
TAVDD
VCCAAD10A
VCCDAD10
VSSDAD10
VDD_4
XM
VSS_4
XTALO
XTALI
VSS33_5
SLIM_SCAN
VDD33_5
QPM
NRST
TMS
PLLAVSS
PLLAVDD
TDI
TCK
VSS33_4
TRST
VDD_3
TDO
VSS_3
SCL
VDD33_4
SDA
NIRQ
TPSOP
TPCLK
TPERR
VDD33_2
TPVALID
TPDATA[0]
VSS33_2
TPDATA[1]
VSS_2
TPDATA[2]
VDD_2
TPDATA[3]
TPDATA[4]
TPDATA[5]
TPDATA[6]
VDD33_3
TPDATA[7]
VSS33_3
R450 0
R444 22
R445 22
MSCL
MSDA
R438 OPT
C439 OPT
C440 OPT
R440 100
R441 100
R442 100
TS_CLK
TS_SYNC
TS_VALID
AR401 100
AR402 100
TS[7]
TS[6]
TS[5]
TS[4]
TS[3]
TS[2]
TS[1]
TS[0]
TS[0-7]
+3.3V_DVDD
R431 470
LD400
PV
PV
JTAG
JP1
JP2
JP3
JP4

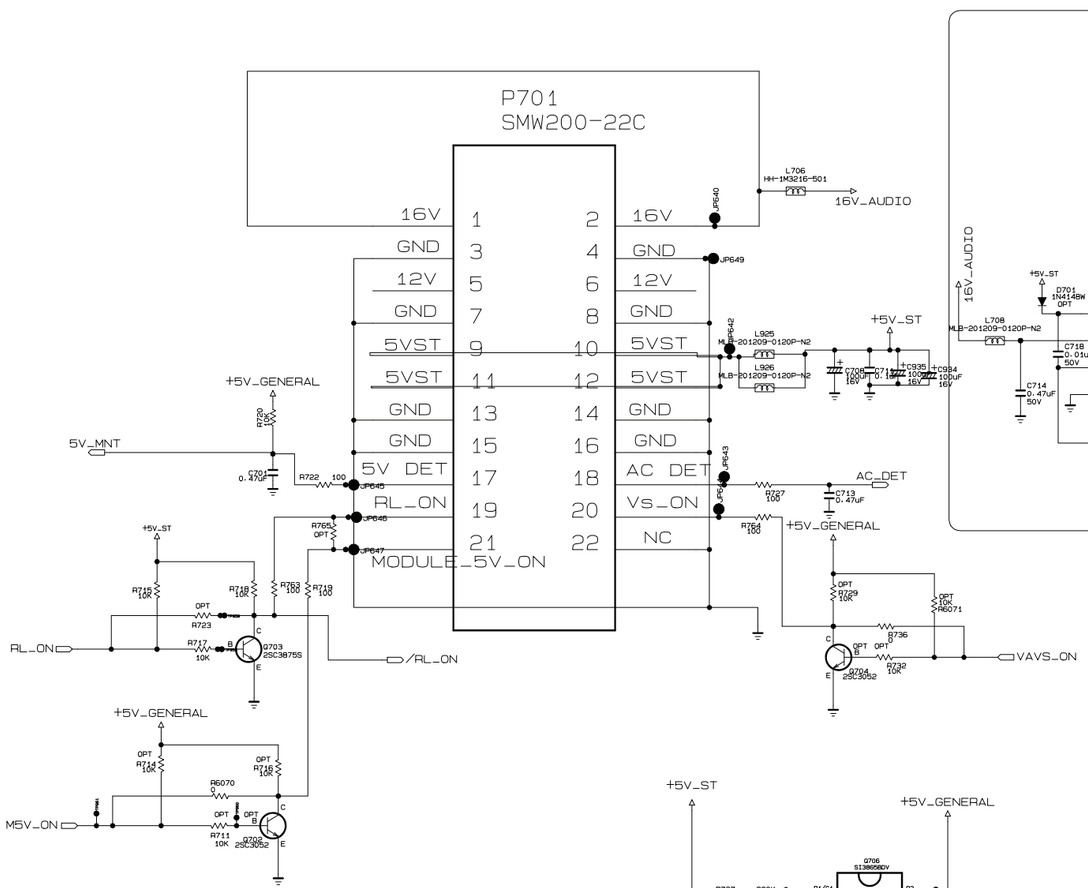
TUNER B+ BLOCK
+5V_TUNER
L401 500-ohm
+5V_TU
C404 1000pF 50V
C408 0.1uF 50V
C410 2.2uF 16V

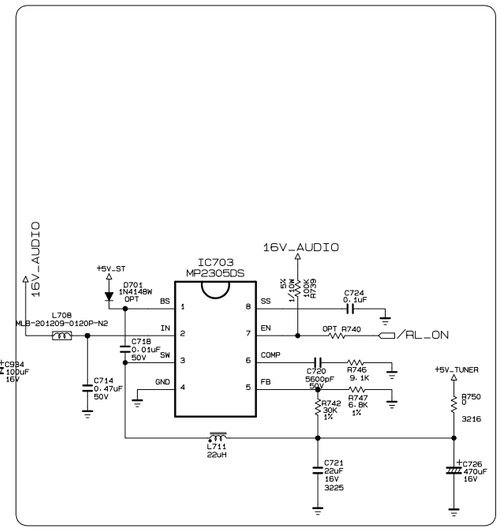
VSB +1.0V B+ BLOCK
+1.2V_PVSB
+1.2V_DVDD
R429 0 1/4W 5%
C413 10uF 16V 3216
C414 0.1uF 50V
C415 0.1uF 50V
C416 0.1uF 50V
C417 0.1uF 50V

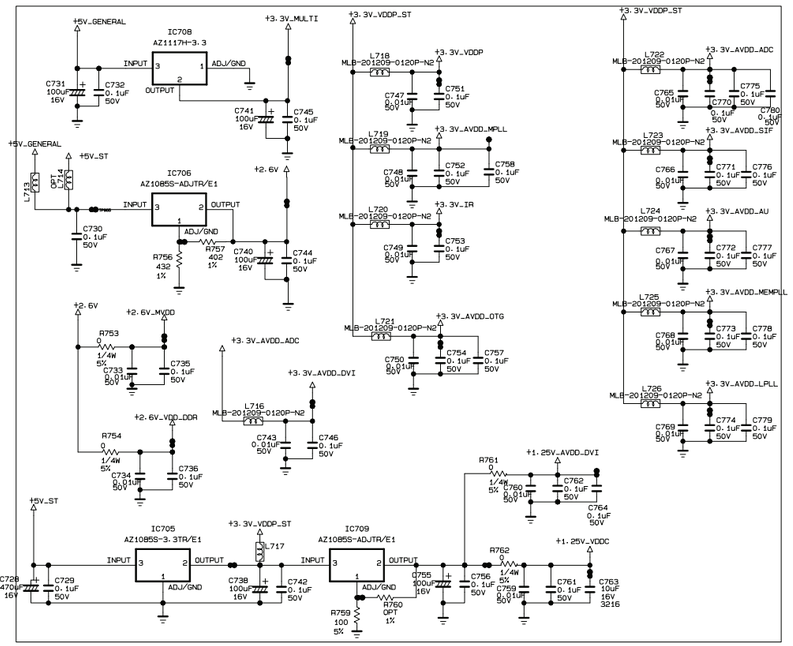
VSB +3.3V B+ BLOCK
+3.3V_PVSB
+3.3V_AVDD
+3.3V_PVSB
+3.3V_DVDD
L405 500-ohm
L406 500-ohm
C426 10uF 16V 3216
C427 0.1uF 50V
C428 1uF 50V
C429 1uF 50V
C430 1uF 50V
C431 10uF 16V 3216
C432 0.1uF 50V
C434 1uF 50V
C436 1uF 50V
C437 1uF 50V
C438 1uF 50V

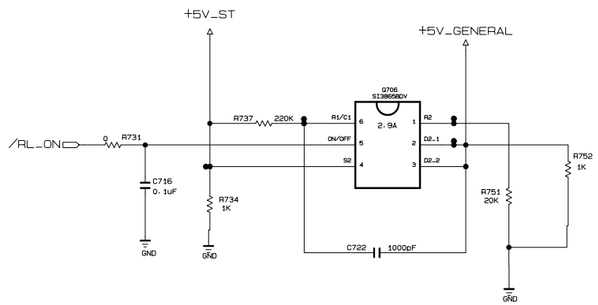

+3.3V_MULTI
IC501
AZ1117H-1.8TRE1(EH13A)
INPUT
ADJ/GND
OUTPUT
+1.8V_NTP
C501 0.1uF
C509 0.1uF
L_SOUND_N
L_SOUND_P
R_SOUND_N
R_SOUND_P
SMAW250-04
JK501
16V_AUDIO
C825 330uF 35V
C515 330uF 35V
C522 0.1uF
C524 0.01uF
R521 3.3
C516 0.1uF
C517 0.1uF
D501 1N4148W 100V
D502 1N4148W 100V
D503 1N4148W 100V
D504 1N4148W 100V
D505 1N4148W 100V
L919 DA-8580
L920 DA-8580
C539 OPT
C540 1000pF
R525 OPT
R527 4.7
R523 OPT
R528 4.7
C536 OPT
C537 OPT
C541 1000pF
C542 1000pF
R524 OPT
R529 4.7
R526 OPT
R530 4.7
C538 OPT
C543 1000pF
C544 0.1uF
C545 0.1uF
C546 0.1uF
C547 0.1uF
C548 0.47uF
C549 0.47uF
R535 4.7K
R534 4.7K
R536 4.7K
R537 4.7K
C552 0.01uF
C550 0.01uF
C551 0.01uF
R541 3.3
R539 3.3
R542 3.3
R540 3.3
L509 1200HM
L510 1200HM
L511 1200HM
L512 1200HM
+3.3V_MULTI
D501
47K R6021
1uF C823 25V
R6034 OPT
NTP_RESET
R502 100
C507 100pF
C510 0.1uF
GND
1uF C511
+1.8V_NTP
C502 100pF
L502 1200HM
LFM
F9
R501 3.3K
C504 1000pF
0.1uF C506
C508 10uF 16V
L501 1200HM
C503 0.1uF
C505 10uF 16V
I2S_MCLK
1:N3
LFM
B10
C514 22000pF
C518 22000pF
C526 1uF
C530 1uF
C529 22000pF
C528 22000pF
C525 1uF
C532 330uF 35V
C534 0.1uF
C535 0.01uF
R522 3.3
IC502
NTP3000A
IIC CH3`
0x54
PGND1A
PGND1A
OUT1A
OUT1A
PVDD1A
PVDD1B
PVDD1B
OUT1B
OUT1B
PGND1B
PGND1B
BST1B
VDR1B
BST1A
VDR1A
/RESET
AD
VSS_IO
CLK_I
CLK_O
VDD_IO
DGNDPLL
AGNDPLL
LFM
AVDDPLL
DVDDPLL
NC
NC
VDR2A
BST2A
PGND2A
PGND2A
OUT2A
OUT2A
PVDD2A
PVDD2A
PVDD2B
PVDD2B
OUT2B
OUT2B
PGND2B
DVSS
DVDD
SDATA
WCK
BCK
SDA
SCL
PWM_SWB
PWM_SWA
PROTECT
FAULT
VDR2B
BST2B
PGND2B
1:03 DATA
1:N3 LRCLK
1:03 SCLK
MSDA
MSCL
R511 22
R512 22
NTP_FAULT
U6
C512 OPT
C513 OPT
+1.8V_NTP
L504 1200HM
C520 0.1uF
C523 10uF 16V
+3.3V_VDDP_ST
R532 4.7K
R538 4.7K
05
NTP_FAULT
R531 0
Q501 2SC3875S
R533 4.7K
Q502 2SC3875S
R543 33K
AC_DET

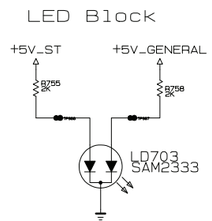
4 2 P G 2 0

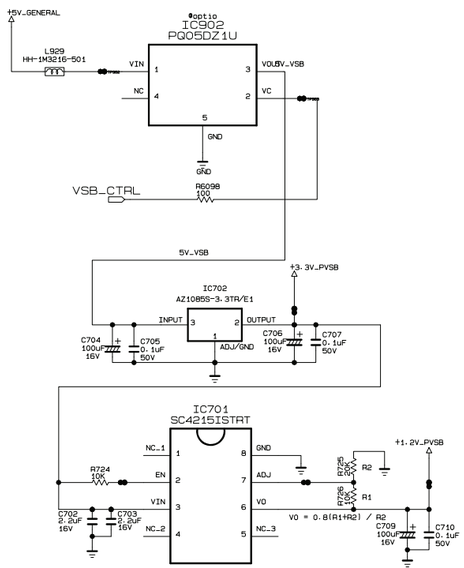

P701
SMW200-22C
16V
GND
12V
GND
5VST
5VST
GND
GND
5V DET
RL_ON
MODULE_5V_ON
16V
GND
12V
GND
5VST
5VST
GND
GND
AC DET
Vs_ON
NC
L706
HH-1M3216-501
16V_AUDIO
+5V_ST
+5V_GENERAL
5V_MNT
/RL_ON
AC_DET
VAVS_ON
M5V_ON
Q703
2SC3875S
Q704
2SC3052
Q705
2SC3052

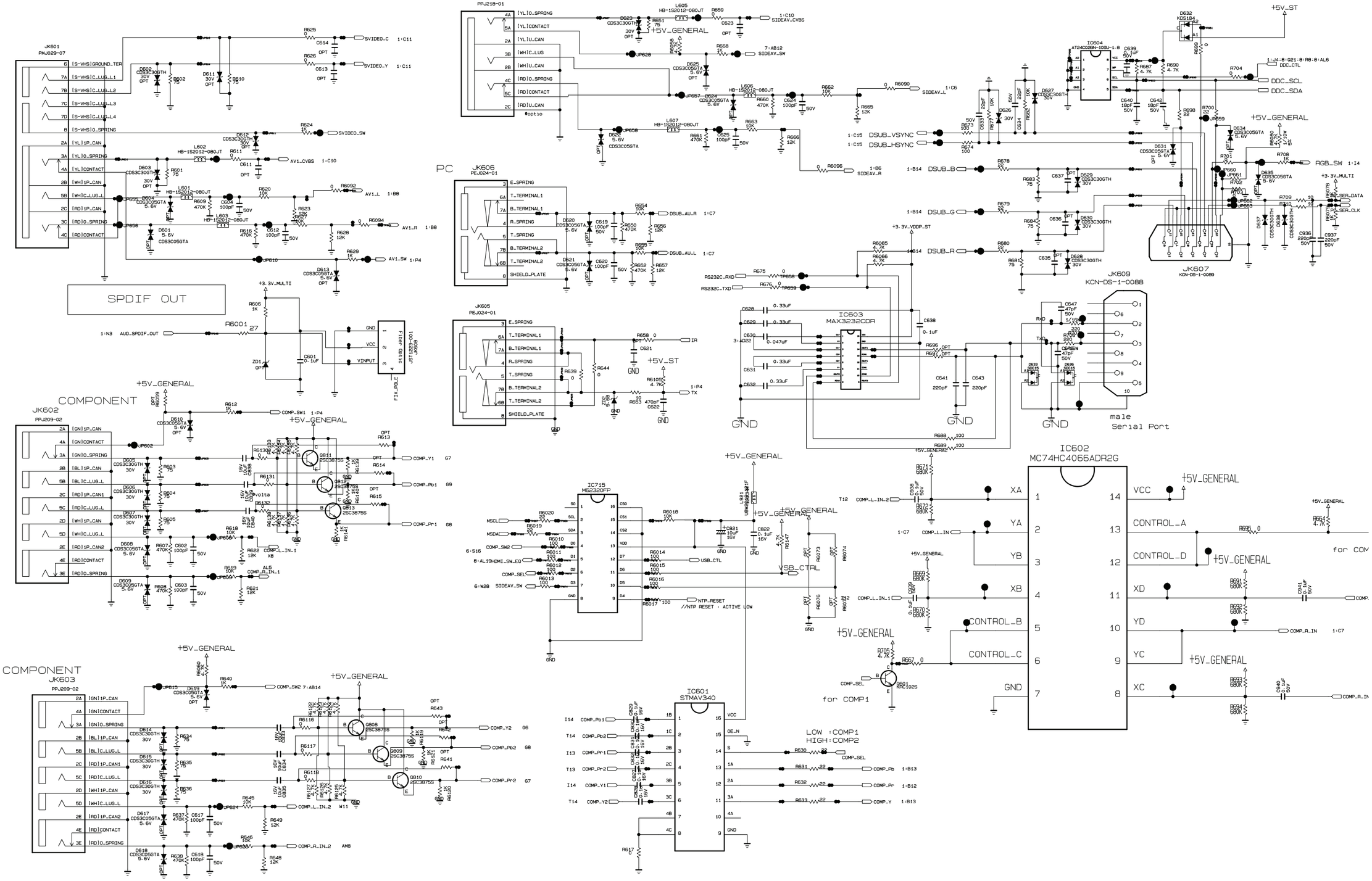

16V_AUDIO
L708
MLB-201209-0120P-N2
IC703
MP2305DS
D701
1N4148W
C718
0.01uF
50V
C714
0.47uF
50V
C724
0.1uF
R740
/RL_ON
C720
5600pF
50V
R746
9.1K
R747
6.8K
R742
30K
L711
22uH
C721
22uF
16V
3225
+5V_TUNER
R750
0
3216
C726
470uF
16V

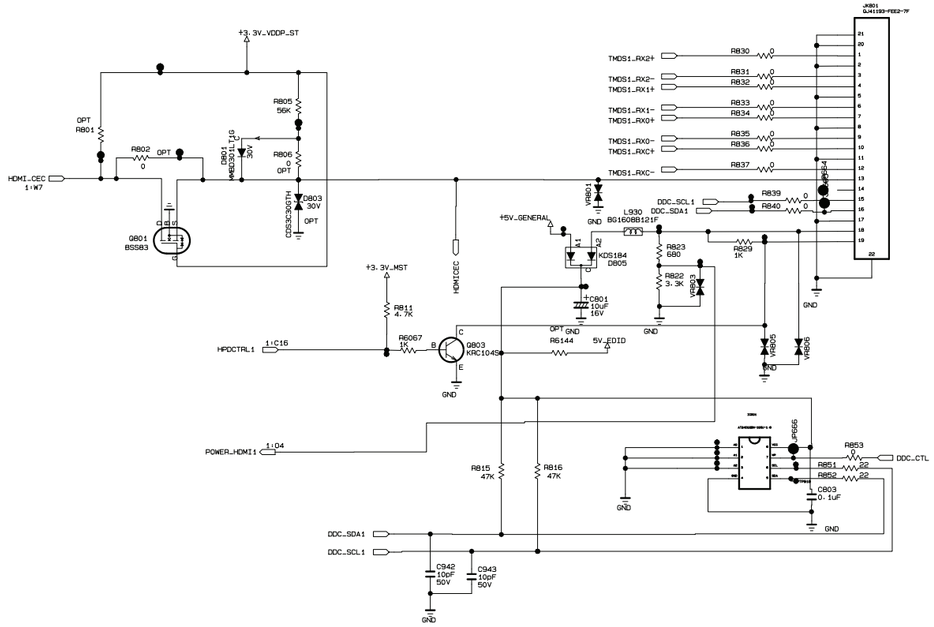

+5V_GENERAL
IC708
AZ1117H-3.3
INPUT
ADJ/GND
OUTPUT
C731
100uF
16V
C732
0.1uF
50V
C741
100uF
16V
C745
0.1uF
50V
+3.3V_MULTI
+2.6V
C740
100uF
16V
C744
0.1uF
50V
R757
402
1%
R756
432
1%
IC706
AZ1085S-ADJTR/E1
C730
0.1uF
50V
+5V_ST
+3.3V_VDDP_ST
L718
MLB-201209-0120P-N2
+3.3V_VDDP
C747
0.01uF
50V
C751
0.1uF
50V
L719
MLB-201209-0120P-N2
+3.3V_AVDD_MPLL
C748
0.01uF
50V
C752
0.1uF
50V
C758
0.1uF
50V
L720
MLB-201209-0120P-N2
+3.3V_IR
C749
0.01uF
50V
C753
0.1uF
50V
L721
MLB-201209-0120P-N2
+3.3V_AVDD_OTG
C750
0.01uF
50V
C754
0.1uF
50V
C757
0.1uF
50V
+3.3V_VDDP_ST
L722
MLB-201209-0120P-N2
+3.3V_AVDD_ADC
C765
0.01uF
50V
C770
0.1uF
50V
C775
0.1uF
50V
C780
0.1uF
50V
L723
MLB-201209-0120P-N2
+3.3V_AVDD_SIF
C766
0.01uF
50V
C771
0.1uF
50V
C776
0.1uF
50V
L724
MLB-201209-0120P-N2
+3.3V_AVDD_AU
C767
0.01uF
50V
C772
0.1uF
50V
C777
0.1uF
50V
L725
MLB-201209-0120P-N2
+3.3V_AVDD_MEMPLL
C768
0.01uF
50V
C773
0.1uF
50V
C778
0.1uF
50V
L726
MLB-201209-0120P-N2
+3.3V_AVDD_LPLL
C769
0.01uF
50V
C774
0.1uF
50V
C779
0.1uF
50V
+2.6V_MVDD
R753
0
1/4W
5%
C733
0.01uF
50V
C735
0.1uF
50V
+3.3V_AVDD_ADC
+3.3V_AVDD_DVI
L716
MLB-201209-0120P-N2
C743
0.01uF
50V
C746
0.1uF
50V
+2.6V_VDD_DDR
R754
0
1/4W
5%
C734
0.01uF
50V
C736
0.1uF
50V
+1.25V_AVDD_DVI
R761
0
1/4W
5%
C760
0.01uF
50V
C762
0.1uF
50V
C764
0.1uF
50V
+5V_ST
IC705
AZ1085S-3.3TR/E1
C728
470uF
16V
C729
0.1uF
50V
+3.3V_VDDP_ST
L717
C738
100uF
16V
C742
0.1uF
50V
IC709
AZ1085S-ADJTR/E1
R759
100
5%
R760
OPT
1%
+1.25V_VDDC
R762
0
1/4W
5%
C755
100uF
16V
C756
0.1uF
50V
R763
10uF
16V
3216
C761
0.1uF
50V
C759
0.01uF
50V

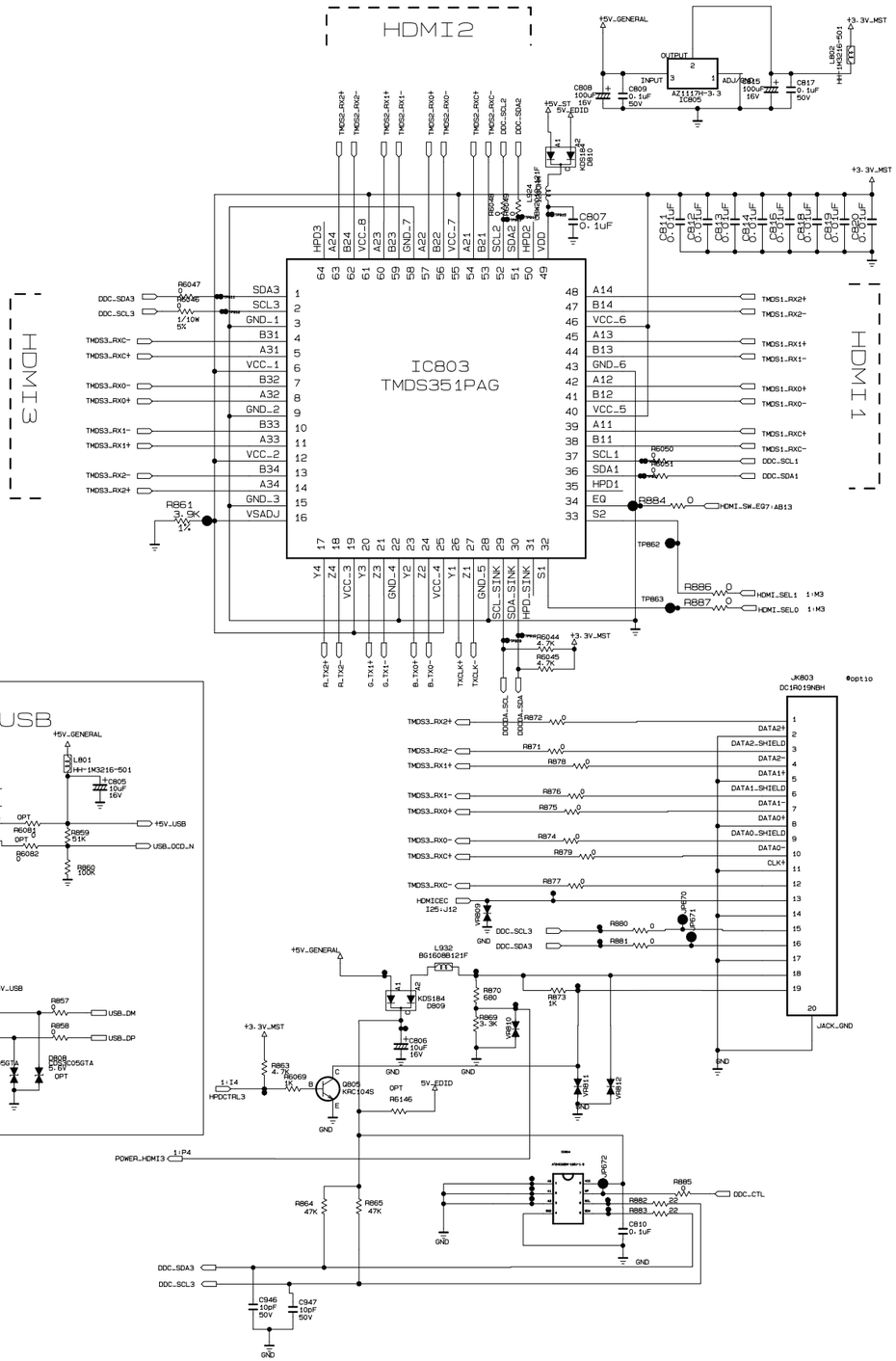

+5V_ST
+5V_GENERAL
/RL_ON
R731
0
R737
220K
C716
0.1uF
R734
1K
IC706
S1J60560V
2.9A
R1/C1
ON/OFF
S2
R2
D2.1
D2.2
R752
1K
R751
20K
C722
1000pF
GND

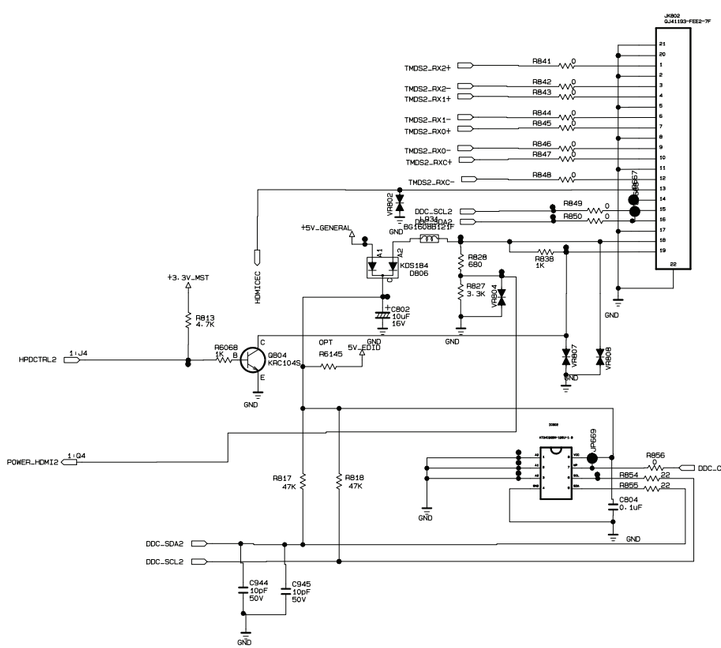

LED Block
+5V_ST
+5V_GENERAL
R755
8K
R758
8K
LD703
SAM2333

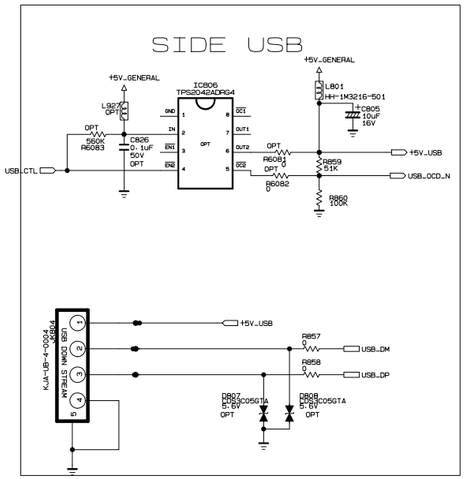

+5V_GENERAL
L929
HH-1M3216-501
optio
IC902
PQ05DZ1U
VIN
NC
VOUT
VC
GND
5V_VSB
VSB_CTRL
R6098
100
+3.3V_PVSB
IC702
AZ1085S-3.3TR/E1
INPUT
OUTPUT
ADJ/GND
C704
100uF
16V
C705
0.1uF
50V
C706
100uF
16V
C707
0.1uF
50V
IC701
SC4215ISTRT
NC_1
EN
VIN
NC_2
GND
ADJ
VO
NC_3
R724
10K
C702
2.2uF
16V
C703
2.2uF
16V
R705
R706
VO = 0.8(R1+R2) / R2
+1.2V_PVSB
C709
100uF
16V
C710
0.1uF
50V


JK501
PMJ029-07
SPDIF OUT
AUD_SPDIF_OUT
R6001
27
ZD1
C591
0.1uF
+3.3V_MULTI
R606
1K
FIBER OPTIC
FIX_POLE
+5V_GENERAL
COMPONENT
JK602
PPJ209-02
COMP_SW1
COMP_Y1
COMP_Pb1
COMP_Pr1
COMP_L_IN_1
COMP_R_IN_1
JK603
COMP_SW2
COMP_Y2
COMP_Pb2
COMP_Pr2
COMP_L_IN_2
COMP_R_IN_2
JK606
PEJ024-01
JK605
PEJ024-01
DSUB_AU_R
DSUB_AU_L
IR
TX
JK601
PPJ218-01
SIDEAV_CVBS
SIDEAV_SW
SIDEAV_L
SIDEAV_R
DSUB_VSYNC
DSUB_HSYNC
DSUB_B
DSUB_G
DSUB_R
+5V_GENERAL
IC715
MS2320FP
MSCL
MSDA
COMP_SW2
HDMI_SW_EQ
COMP_SEL
SIDEAV_SW
USB_CTL
VSB_CTRL
NTP_RESET
//NTP RESET : ACTIVE LOW
IC603
MAX3232CDR
RS232C_RXD
RS232C_TXD
JK609
KCN-DS-1-0088
JK607
KCN-DS-1-0089
male
Serial Port
IC604
AT24C02BN-10SU-1.8
DDC_CTL
DDC_SCL
DDC_SDA
RGB_SW
SER_DATA
SER_CLK
+3.3V_MULTI
+3.3V_VDDP_ST
IC601
STMAV340
LOW :COMP1
HIGH:COMP2
for COMP1
IC602
MC74HC4066ADR2G
CONTROL_A
CONTROL_B
CONTROL_C
CONTROL_D
for COM
COMP_L_IN
COMP_R_IN
COMP_L_IN_1
COMP_L_IN_2
COMP_SEL
COMP_Pb
COMP_Pr
COMP_Y

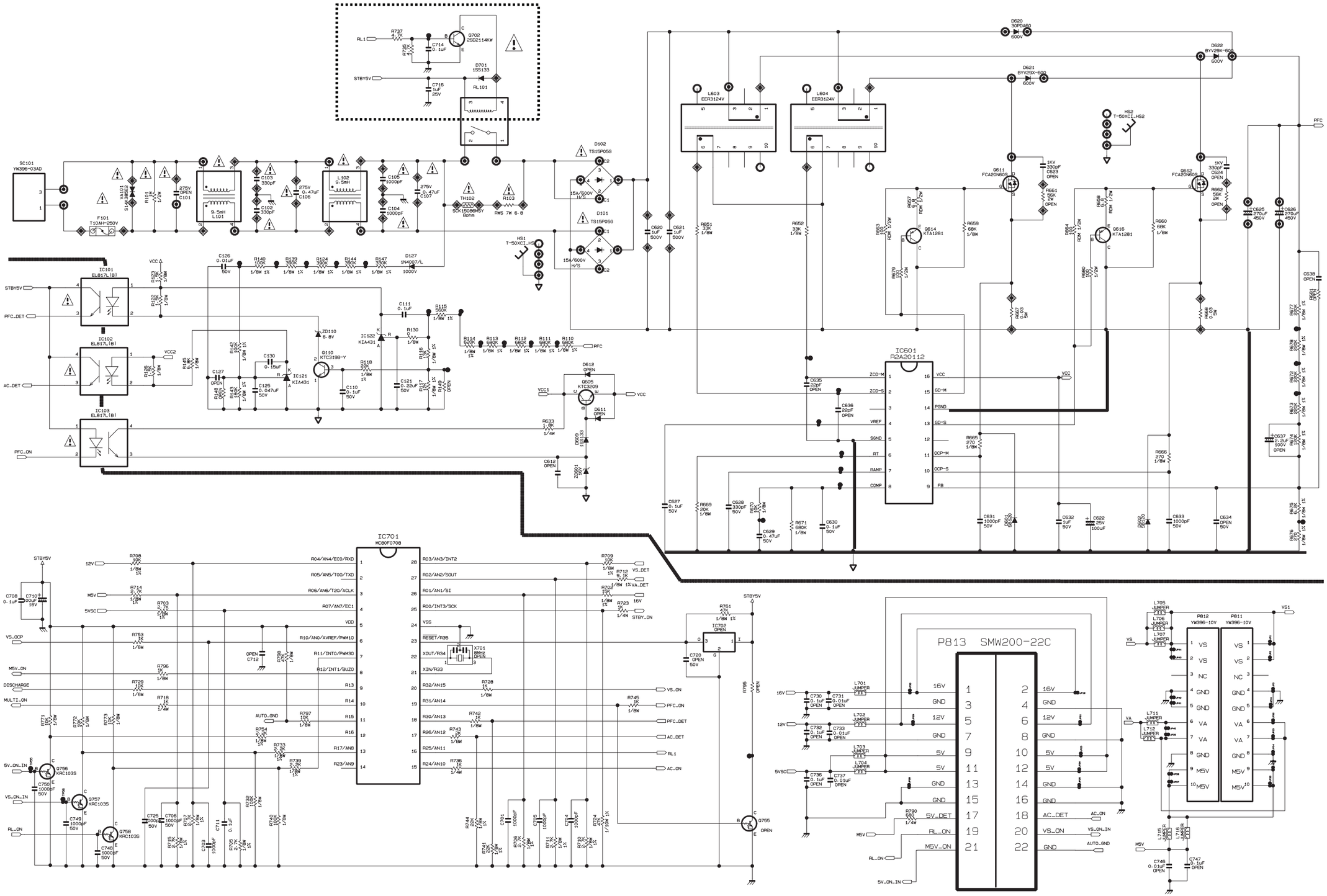

+3.3V_VDDP_ST
HDMI_CEC 1:M7
Q801 BSS83
D803 30V
HDMICEC
+5V_GENERAL
+3.3V_MST
HPDCTRL1 1:C16
Q803 KRC104S
5V_EDID
POWER_HDMI1 1:D4
DDC_SDA1
DDC_SCL1
DDC_CTL
TMDS1_RX2+
TMDS1_RX2-
TMDS1_RX1+
TMDS1_RX1-
TMDS1_RX0+
TMDS1_RX0-
TMDS1_RXC+
TMDS1_RXC-
L930 BG1608B121F
IC801 TMDS351PAG
GND

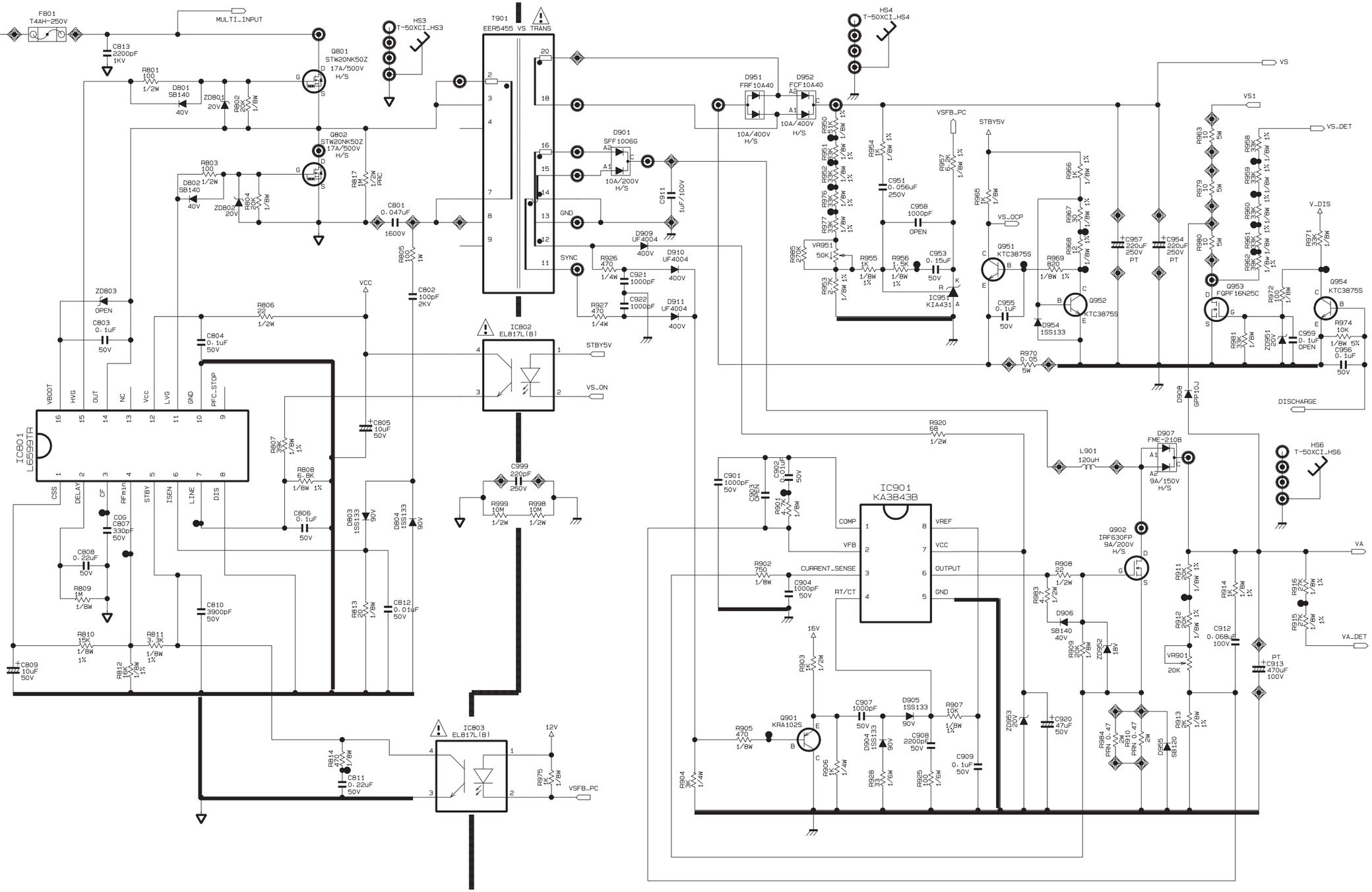

HDMI2
HDMI3
HDMI1
IC803
TMDS351PAG
+5V_GENERAL
+3.3V_MST
DDC_SDA3
DDC_SCL3
TMDS3_RX2+
TMDS3_RX2-
TMDS3_RXC+
TMDS3_RXC-
TMDS3_RX1+
TMDS3_RX1-
TMDS3_RX0+
TMDS3_RX0-
TMDS1_RX2+
TMDS1_RX2-
TMDS1_RXC+
TMDS1_RXC-
TMDS1_RX1+
TMDS1_RX1-
TMDS1_RX0+
TMDS1_RX0-
DDC_SCL1
DDC_SDA1
HDMI_SW_EG7:AB13
HDMI_SEL1 1:M3
HDMI_SEL0 1:M3
HPDCTRL3 1:I4
POWER_HDMI3 1:P4
DDC_CTL
JK803 DC1R019NBH
JACK_GND

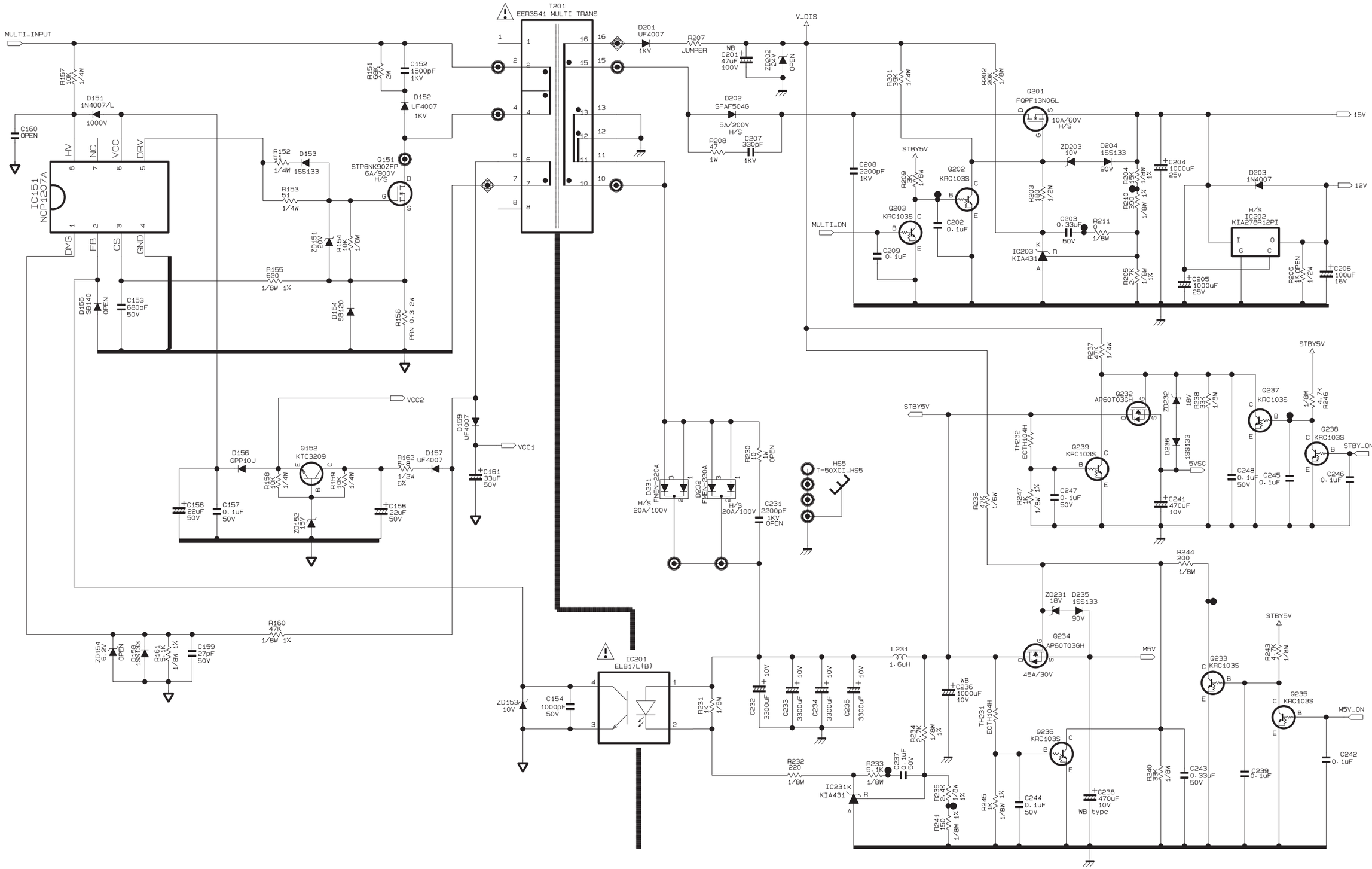

HDMI2
TMDS2_RX2+
TMDS2_RX2-
TMDS2_RX1+
TMDS2_RX1-
TMDS2_RX0+
TMDS2_RX0-
TMDS2_RXC+
TMDS2_RXC-
+5V_GENERAL
+3.3V_MST
HPDCTRL2 1:J4
Q804 KRC104S
5V_EDID
POWER_HDMI2 1:D4
DDC_SDA2
DDC_SCL2
DDC_CTL
L930 BG1608B121F
GND

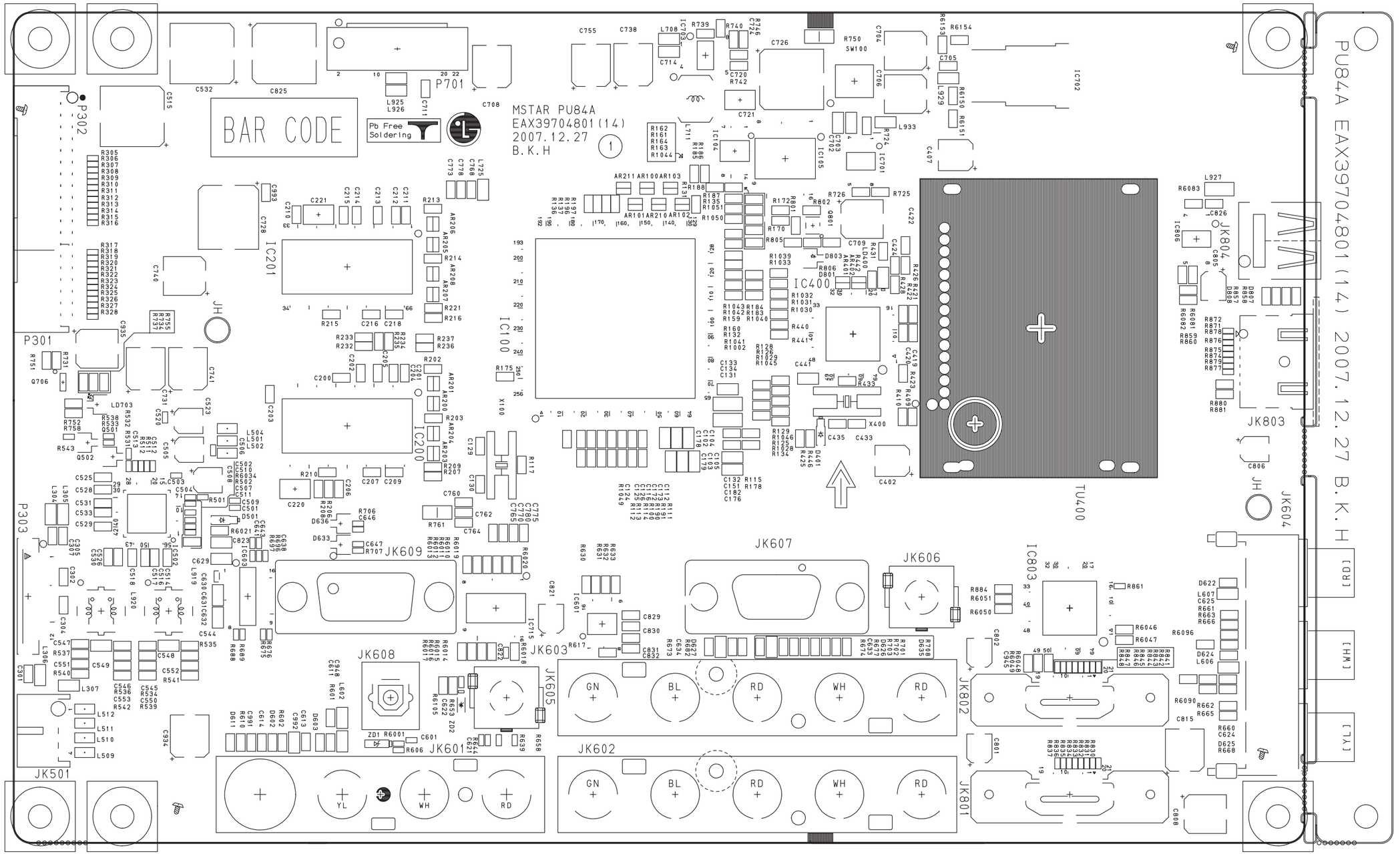

SIDE USB
+5V_GENERAL
IC806 TPS2042ADRG4
USB_CTL
+5V_USB
USB_OCD_N
USB_DM
USB_DP
GND

HDMI3
+5V_GENERAL
+3.3V_MST
JK803 DC1R019NBH
TMDS3_RX2+
TMDS3_RX2-
TMDS3_RX1+
TMDS3_RX1-
TMDS3_RX0+
TMDS3_RX0-
TMDS3_RXC+
TMDS3_RXC-
HDMICEC
DDC_SCL3
DDC_SDA3
HPDCTRL3 1:I4
Q805 KRC104S
5V_EDID
POWER_HDMI3 1:P4
DDC_CTL
JACK_GND
GND


SC101
YW396-03AD
F101
T10AH-250V
VA101
S14K385E2
R101
1M
1/2W
275V
OPEN
C101
L101
9.5mH
C103
330pF
C102
330pF
275V
0.47uF
C106
L102
9.5mH
C105
1000pF
C104
1000pF
275V
0.47uF
C107
TH102
SCK15D80M5Y
8ohm
R103
RWS 7W 6.8
D102
TS15P05G
15A/600V
H/S
D101
TS15P05G
15A/600V
H/S
C620
1uF
500V
C621
1uF
500V
HS1
T-50XCI_HS
L603
EER3124V
L604
EER3124V
R651
33K
1/8W
R652
33K
1/8W
D620
30PQ60
600V
D622
BYV29X-600
600V
D621
BYV29X-600
600V
HS2
T-50XCI_HS2
PFC
Q611
FCA20N60S
1KV
330pF
C623
OPEN
R661
56K
2W
OPEN
Q612
FCA20N60S
1KV
330pF
C624
OPEN
R662
56K
2W
OPEN
R657
47K
RDM 1/2W
R658
47K
RDM 1/2W
Q614
KTA1281
Q616
KTA1281
R659
68K
1/8W
R660
68K
1/8W
R663
100
RDM 1/2W
R664
100
RDM 1/2W
R670
0.03
5W
R668
0.03
5W
LC625
270uF
450V
LC626
270uF
450V
C638
OPEN
R681
1M
1/8W
R677
1M
1/8W
R678
1M
1/8W
R672
1M
1/8W
R673
1M
1/8W
C637
2.2uF
100V
OPEN
R674
1M
1/8W
R675
1M
1/8W
R676
1M
1/8W
IC101
EL817L(B)
IC102
EL817L(B)
IC103
EL817L(B)
STBY5V
PFC_DET
AC_DET
PFC_ON
VCC
VCC2
R123
1/8W
R122
1/8W
R126
1/8W
R125
1/8W
C126
0.01uF
50V
R140
100K
1/8W 1%
R139
100K
1/8W 1%
R124
100K
1/8W 1%
R144
100K
1/8W 1%
R147
100K
1/8W 1%
D127
1N4007/L
1000V
C111
0.1uF
R115
560K
1/8W 1%
R114
560K
1/8W 1%
R113
560K
1/8W 1%
R112
560K
1/8W 1%
R111
560K
1/8W 1%
R110
560K
1/8W 1%
PFC
ZD110
6.8V
G110
KTC3198-Y
IC122
KIA431
R130
0
1/8W
R118
22K
1/8W
1%
C121
0.22uF
50V
R117
1K
1/8W 1%
R149
OPEN
C110
0.1uF
50V
C127
OPEN
R148
10K
1/8W 1%
R143
10K
1/8W 1%
C125
0.047uF
50V
R142
1/8W 1%
C130
0.15uF
IC121
KIA431
R116
1/8W 1%
D612
OPEN
Q605
KTC3209
VCC1
VCC
D611
OPEN
R633
1.8K
1/4W
D603
1SS133
D512
OPEN
ZD501
6.8V
IC601
R2A20112
ZCD-M
ZCD-S
VREF
SSND
RT
RAMP
COMP
VCC
GD-M
PGND
GD-S
OCP-M
OCP-S
FB
C635
22pF
OPEN
C636
22pF
OPEN
C627
0.1uF
50V
R669
20K
1/8W
C628
330pF
50V
R670
1.8K
1/8W
C629
0.47uF
50V
R671
680K
1/8W
C630
0.1uF
50V
R665
270
1/8W
R666
270
1/8W
C631
1000pF
50V
DD15
6V
C632
1uF
50V
C622
25V
100uF
R662
180K
1/8W
C633
1000pF
50V
C634
OPEN
50V
IC701
MC80F0708
R04/AN4/EC0/RXD
R05/AN5/T00/TXD
R06/AN6/T20/ACLK
R07/AN7/EC1
VDD
R10/AN0/AVREF/PWM10
R11/INT0/PWM30
R12/INT1/BUZO
R13
R14
R15
R16
R17/AN8
R23/AN9
R03/AN3/INT2
R02/AN2/SOUT
R01/AN1/SI
R00/INT3/SCK
VSS
RESET/R35
XOUT/R34
XIN/R33
R32/AN15
R31/AN14
R30/AN13
R26/AN12
R25/AN11
R24/AN10
X701
8MHz
OPEN
STBY5V
12V
5VSC
VS_OCP
MSV_ON
DISCHARGE
MULTI_ON
5V_ON_IN
VS_ON_IN
RL_ON
AUTO_GND
R708
10K
1/8W
1%
R714
2.7K
1/8W
1%
R703
2.7K
1/8W
1%
R753
1K
1/8W
R796
1K
1/8W
R729
10K
1/8W
R718
1K
1/4W
R771
10K
1/8W
R772
10K
1/8W
R773
10K
1/8W
R797
10K
1/8W
R754
2.2K
1/8W
1%
R733
2.2K
1/8W
1%
R739
2.2K
1/8W
1%
R709
10K
1/8W
1%
R712
9.1K
1/8W
1%
R702
10K
1/8W
1%
R723
1K
1/4W
VS_DET
VA_DET
16V
STBY_ON
R728
1K
1/8W
R742
1K
1/8W
R743
2K
1/8W
R736
1K
1/4W
VS_ON
PFC_ON
PFC_DET
AC_DET
RL_ON
AC_ON
R745
1K
1/8W
C708
0.1uF
C710
100uF
16V
C712
OPEN
R758
47K
1/8W
C720
OPEN
50V
IC702
OPEN
R761
47K
1/8W
1%
R795
OPEN
Q755
OPEN
Q750
1000pF
50V
Q756
KRC103S
Q757
KRC103S
Q749
1000pF
50V
Q758
KRC103S
Q748
1000pF
50V
R732
10K
1/8W
R760
10K
1/8W
R705
2.7K
1/8W
1%
C711
0.1uF
C703
1000uF
R715
2.7K
1/8W
1%
R707
2.7K
1/8W
1%
C725
1000pF
50V
C706
1000pF
50V
C701
1000pF
R756
1M
1/8W
R744
22K
1/8W
1%
R741
22K
1/8W
1%
C705
1000uF
R711
2.7K
1/8W
1%
C704
1000uF
R710
2.7K
1/8W
1%
R724
2.7K
1/8W
1%
P813 SMW200-22C
16V
GND
12V
GND
5V
5V
GND
GND
5V_DET
RL_ON
M5V_ON
AC_DET
VS_ON
GND
VS_ON_IN
AUTO_GND
L701
JUMPER
L702
JUMPER
L703
JUMPER
L704
JUMPER
C730
0.1uF
OPEN
C731
0.01uF
OPEN
C732
0.1uF
OPEN
C733
0.01uF
OPEN
C736
0.1uF
OPEN
C737
0.01uF
OPEN
R790
680
1/4W
L705
JUMPER
L706
JUMPER
L707
JUMPER
L711
JUMPER
L712
JUMPER
P812
YW396-10V
P811
YW396-10V
VS
VS
NC
GND
GND
VA
VA
GND
M5V
M5V
VS1
L715
JUMPER
L716
JUMPER
C746
0.01uF
OPEN
C747
0.1uF
OPEN


PFC
FB01 T4AH-250V
C813 2200pF 1KV
MULTI_INPUT
HS3 T-50XCI_HS3
T901 EER5455 VS TRANS
HS4 T-50XCI_HS4
R801 100 1/2W
D801 SB140 40V
ZD801 20V
R802 20K 1/8W
Q801 STW20NK50Z 17A/500V H/S
Q802 STW20NK50Z 17A/500V H/S
R803 100 1/2W
D802 SB140 40V
ZD802 20V
R804 20K 1/8W
R817 1M 1/2W PRC
C801 0.047uF 1600V
R805 100 1W
C802 100pF 2KV
D901 SFF1006G 10A/200V H/S
C911 1uF/100V
D909 UF4004 400V
D910 UF4004 400V
D911 UF4004 400V
C921 1000pF
C922 1000pF
R926 470 1/4W
R927 470 1/4W
SYNC
GND
D951 FRF10A40 10A/400V H/S
D952 FCF10A40 10A/400V H/S
VSFB_PC
STBY5V
VS
VS1
VS_DET
V_DIS
VS_OCP
Q951 KTC3875S
Q952 KTC3875S
Q953 FQPF16N25C
Q954 KTC3875S
D954 1SS133
R970 0.05 5W
C955 0.1uF 50V
C956 0.1uF 50V
C957 220uF 250V PT
C954 220uF 250V PT
C951 0.056uF 250V
C958 1000pF OPEN
C953 0.15uF 50V
IC951 KIA431
VR951 50K
R974 10K 1/8W 5%
C959 0.1uF OPEN
ZD951 20V
D908 GPP10J
DISCHARGE
ZD803 OPEN
C803 0.1uF 50V
C804 0.1uF 50V
R806 22 1/2W
VCC
IC802 EL817L(B)
STBY5V
VS_ON
IC801 L6599TR
VBOOT
HVG
OUT
NC
Vcc
LVG
GND
PFC_STOP
CSS
DELAY
CF
RFmin
STBY
ISEN
LINE
DIS
C805 10uF 50V
R807 39K 1/8W 1%
R808 6.8K 1/8W 1%
C806 0.1uF 50V
C807 330pF 50V
C808 0.22uF 50V
R809 1M 1/8W
C810 3900pF 50V
R810 15K 1/8W 1%
R811 3.3K 1/8W 1%
R812 15K 1/8W 1%
C809 10uF 50V
D803 1SS133 90V
D804 1SS133 90V
R813 20 1/8W
C812 0.01uF 50V
C999 220pF 250V
R999 10M 1/2W
R998 10M 1/2W
IC803 EL817L(B)
12V
R814 470 1/8W
C811 0.22uF 50V
R975 1K 1/8W
VSFB_PC
R920 68 1/2W
L901 120uH
D907 FME-210B 9A/150V H/S
HS6 T-50XCI_HS6
IC901 KA3843B
COMP
VFB
CURRENT_SENSE
RT/CT
VREF
VCC
OUTPUT
GND
C901 1000pF 50V
C902 0.01uF 50V
C903 OPEN
R901 47K 1/8W
R902 750 1/8W
C904 1000pF 50V
Q902 IRF630FP 9A/200V H/S
R908 22 1/2W
R983 4.7 1/2W
D906 SB140 40V
R909 20K 1/8W
ZD952 18V
VA
VA_DET
R911 20K 1/8W 1%
R912 20K 1/8W 1%
R914 1K 1/8W 1%
R916 27K 1/8W 1%
R915 27K 1/8W 1%
C912 0.068uF 100V
VR901 20K
PT
C913 470uF 100V
R903 1K 1/2W
Q901 KRA102S
R905 470 1/8W
R904 1K 1/4W
R906 1K 1/4W
C907 1000pF 50V
D904 1SS133 90V
D905 1SS133 90V
R907 10K 1/8W 1%
C908 2200pF 50V
C909 0.1uF 50V
R926 33 1/8W
R925 100 1/8W
ZD953 20V
C920 47uF 50V
R984 PRN 0.47 2W
R910 PRN 0.47 2W
D905 SB120
R913 2K 1/8W 1%


MULTI_INPUT
R157 1K 1/4W
D151 1N4007/L 1000V
C160 OPEN
IC151 NCP1207A
HV NC VCC DRV
DMG FB CS GND
R151 68K 2W
C152 1500pF 1KV
D152 UF4007 1KV
R152 51 1/4W
D153 1SS133
R153 51 1/4W
Q151 STP6NK90ZFP 6A/900V H/S
ZD151 20V
R154 1K 1/8W
R155 620 1/8W 1%
D155 SB140
C153 680pF 50V
D154 SB120
R156 4.7 2W PRN 0.3
T201 EER3541 MULTI TRANS
D201 UF4007 1KV
R207 JUMPER
WB C201 47uF 100V
ZD202 24V OPEN
D202 SFAF504G 5A/200V H/S
R208 47 1W
C207 330pF 1KV
V_DIS
R201 39K 1/4W
R202 2K 1/8W
Q201 FQPF13N06L 10A/60V H/S
16V
STBY5V
C208 2200pF 1KV
R209 3K 1/8W
Q202 KRC103S
Q203 KRC103S
C202 0.1uF
C209 0.1uF
MULTI_ON
ZD203 10V
D204 1SS133 90V
R203 180 1/2W
C203 0.33uF 50V
R211 0 1/8W
IC203 KIA431
R204 51K 1/8W 1%
R210 51K 1/8W 1%
R205 1K 1/8W 1%
C204 1000uF 25V
D203 1N4007
12V
H/S IC202 KIA278R12PI
C205 1000uF 25V
R206 1K OPEN 1/2W
C206 100uF 16V
VCC2
D156 GPP10J
Q152 KTC3209
R158 10K 1/4W
R159 10K 1/4W
R162 6.8 1/2W 5%
D157 UF4007
C156 22uF 50V
C157 0.1uF 50V
ZD152 15V
C158 22uF 50V
D159 UF4007
VCC1
C161 33uF 50V
R160 47K 1/8W 1%
ZD154 6.2V
D158 1SS133
R161 5.1K 1/8W 1%
C159 27pF 50V
IC201 EL817L(B)
ZD153 10V
C154 1000pF 50V
R231 1K 1/8W
C232 3300uF 10V
C233 3300uF 10V
C234 3300uF 10V
C235 3300uF 10V
D231 FMEN-220A H/S 20A/100V
D232 FMEN-220A H/S 20A/100V
R230 10 1W OPEN
C231 2200pF 1KV OPEN
HS5 T-50XCI_HS5
L231 1.6uH
WB C236 1000uF 10V
TH231 ECTH104H
R232 220 1/8W
R233 5.1K 1/8W
C237 0.1uF 50V
R234 2.7K 1/8W 1%
IC231 KIA431
R235 2.4K 1/8W 1%
R241 150 1/8W 1%
R236 2K 1/8W
R237 47K 1/4W
Q232 AP60T03GH
TH232 ECTH104H
Q239 KRC103S
R247 1K 1/8W 1%
C247 0.1uF 50V
ZD232 18V
R238 33K 1/8W
D236 1SS133
5VSC
C241 470uF 10V
Q237 KRC103S
R246 4.7K 1/8W
Q238 KRC103S
STBY_ON
C248 0.1uF 50V
C245 0.1uF
C246 0.1uF
R244 200 1/8W
ZD231 18V
D235 1SS133 90V
Q234 AP60T03GH 45A/30V
M5V
Q233 KRC103S
R243 4.7K 1/8W
Q235 KRC103S
M5V_ON
Q236 KRC103S
R240 33K 1/8W
C243 0.33uF 50V
C239 0.1uF
C242 0.1uF
R245 1K 1/8W 1%
C244 0.1uF 50V
C238 470uF 10V WB type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Pb Free Soldering
MSTAR PU84A
EAX39704801(14)
2007.12.27
B.K.H
PU84A EAX39704801(14) 2007.12.27 B.K.H
P701
P302
P301
P303
IC201
IC200
IC100
IC400
IC702
IC803
JK609
JK608
JK607
JK606
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JK603
JK602
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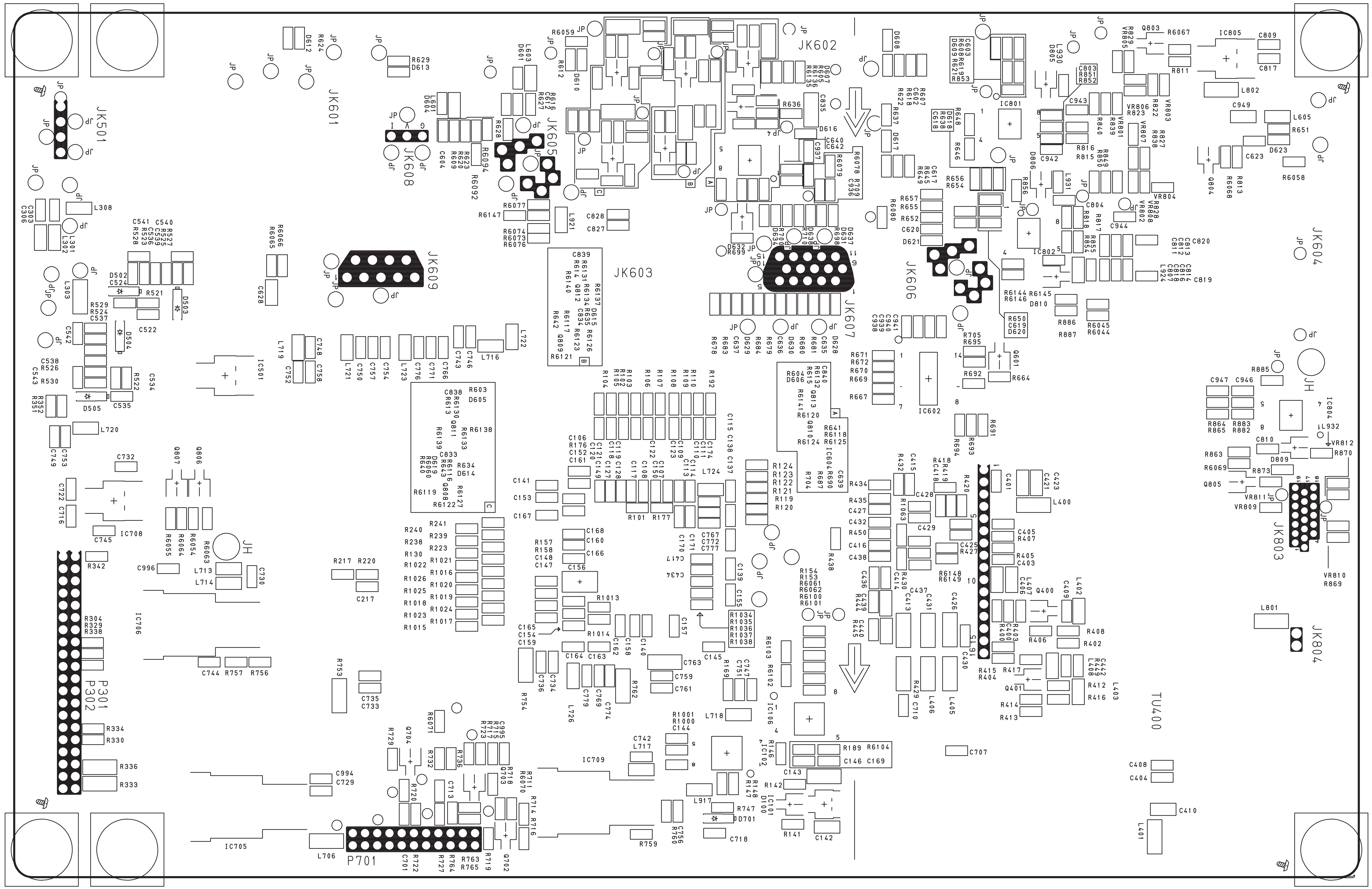
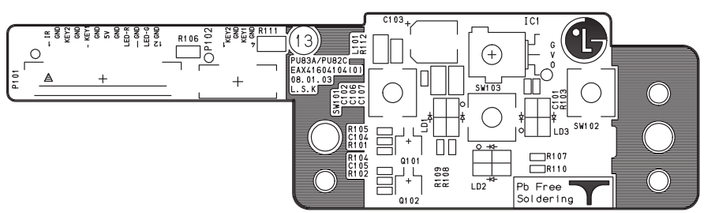
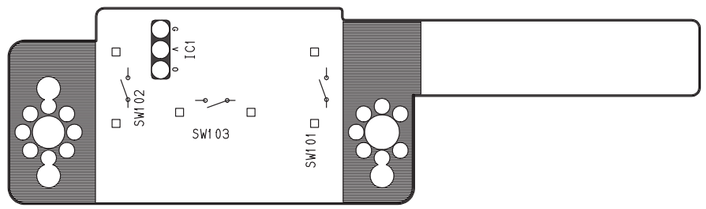


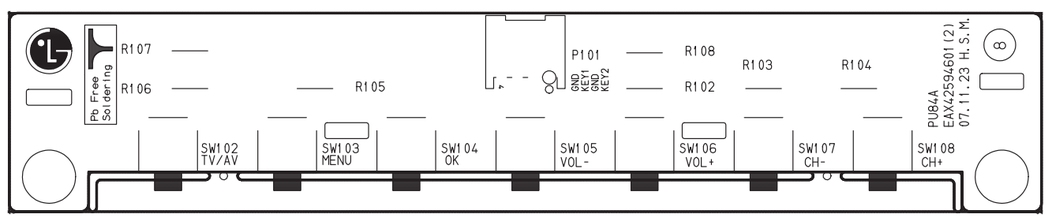
PRE AMP(TOP)



PRE AMP(BOTTOM)



CONTROL(TOP)



CONTROL(BOTTOM)